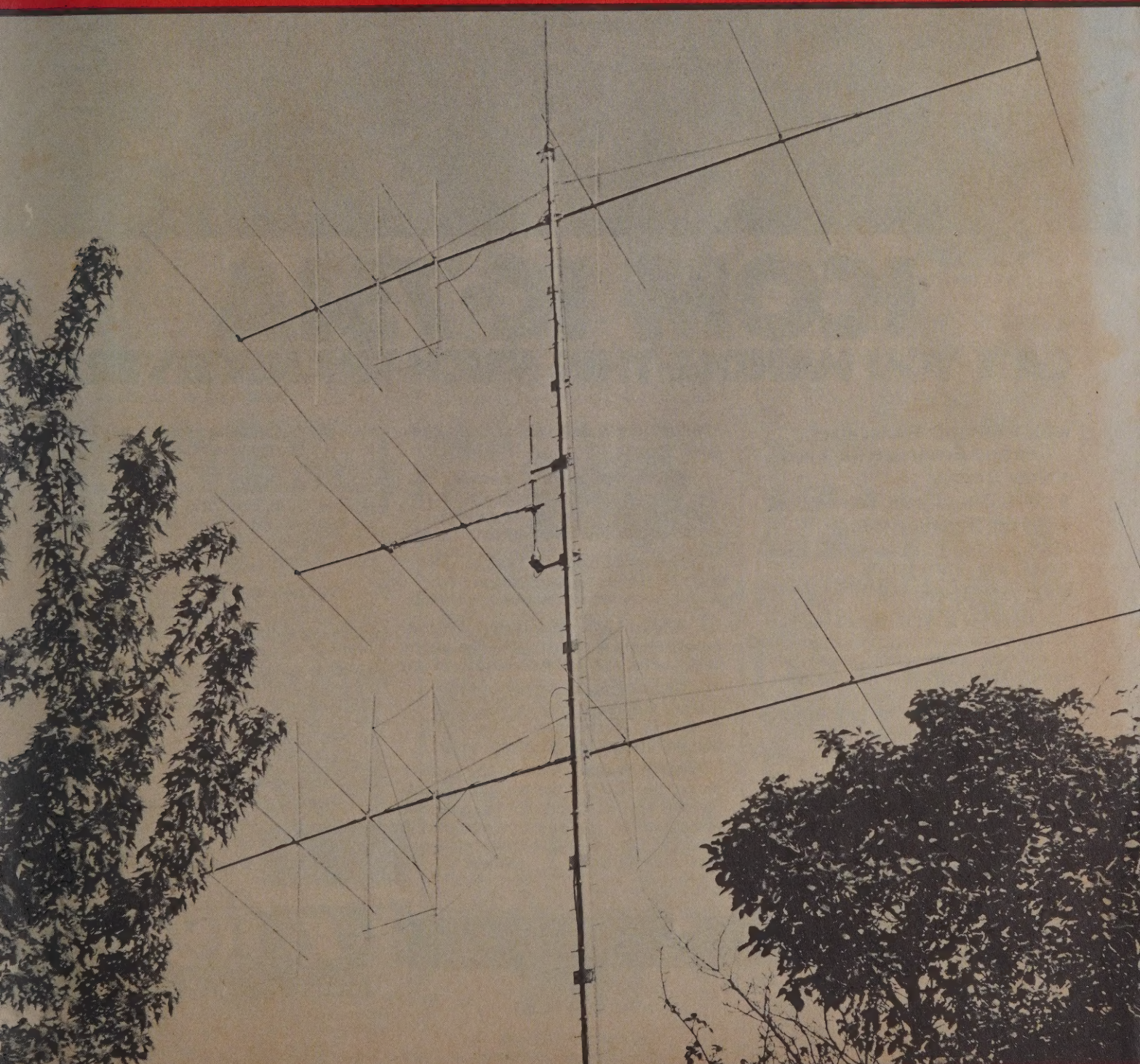
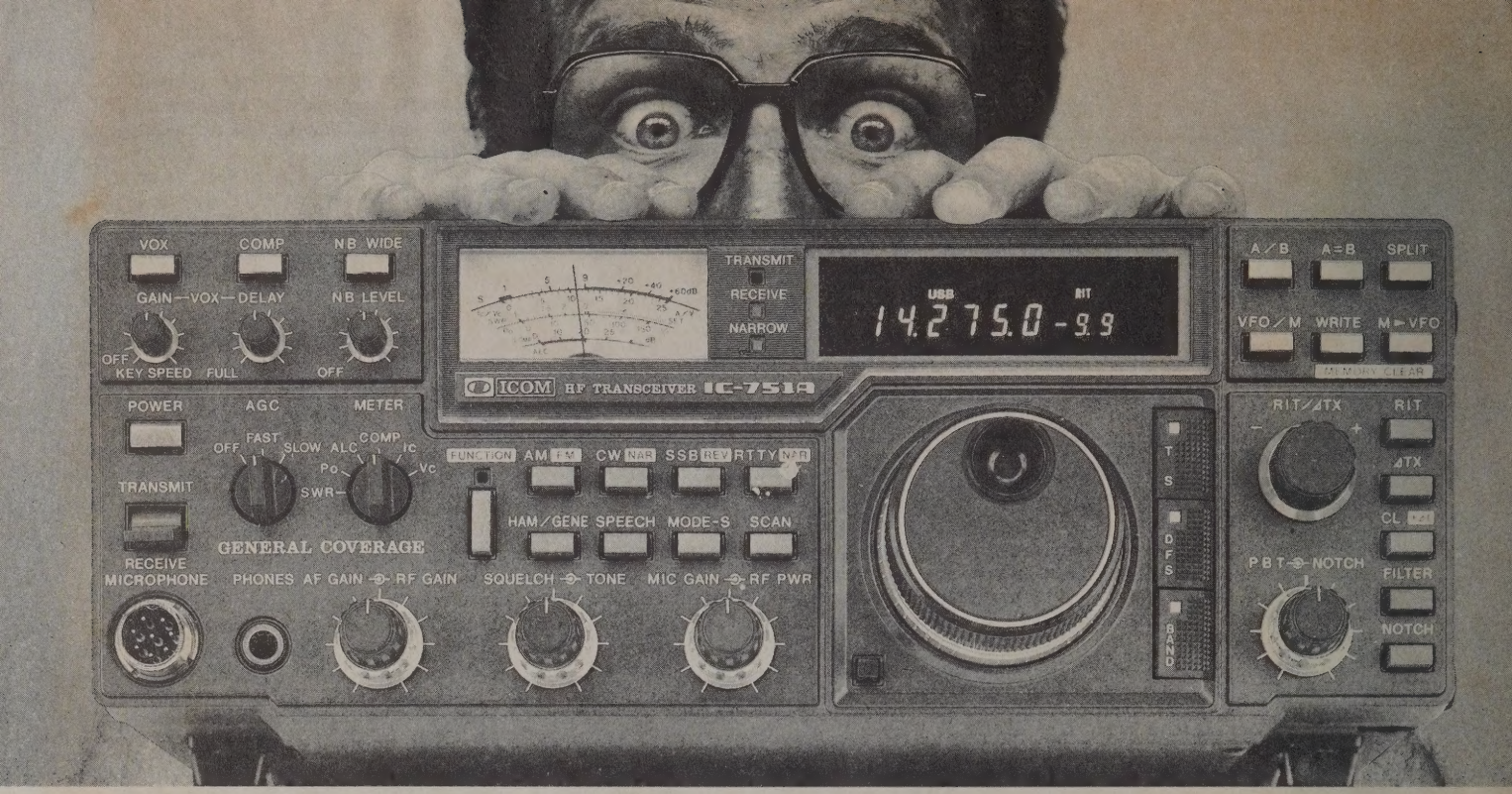
INTN'L MONTHLY MAGAZINE - BY AND FOR ACTIVE RADIOAMATEURS

RADIOSPORTING

JANUARY 1987 No. 23 8701 $2.00



STACKED 15 METER VE3BMV RAZOR BEAMS



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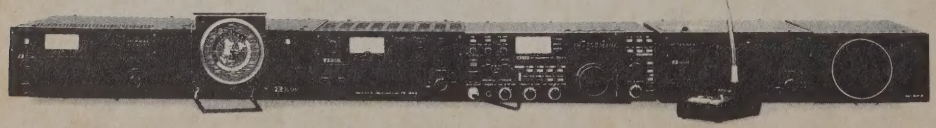

ICOM

First in [illegible]

ICOM America, Inc., 2380-116th Ave NE, Bellevue, WA 98004 / 3150 Premier Drive, Suite 126, Irving, TX 75063

All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 751A486

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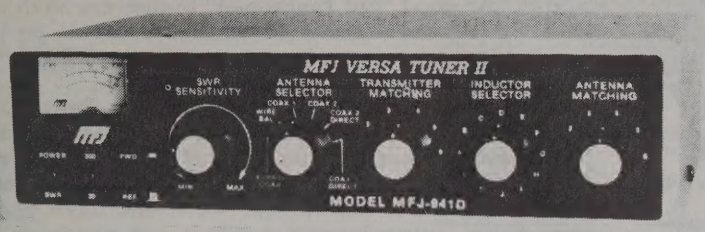

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NEW FEATURES

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- **New airwound inductor!** Larger more efficient 12 position air-wound inductor gives lower losses and more watts out. Run up to 300 watts RF power output. Matches everything from 1.8 to 30 MHz: dipoles, inverted vee, random wires, verticals, mobile whips, beams, balanced and coax lines. Built-in 4:1 balun for balanced lines. 1000V capacitor spacing. Black. 11x3x7 inches. Works with all solid state or tube rigs. Easy to use, anywhere.

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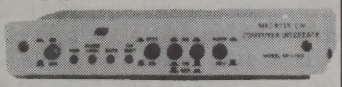

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New Features: individually calibrated resistance scale, expanded capacitance range (±150 pf) Built-in range extender for measurements beyond scale readings. 1-100 MHz. Comprehensive manual. Use 9 V battery. 2x4x4 in.

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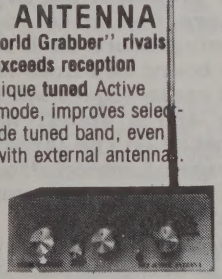

POLICE/FIRE/WEATHER 2 M HANDHELD CONVERTER

Turn your synthesized scanning 2 meter handheld into a hot Police/Fire/Weather band scanner! **$39.95** MFJ-313

144-148 MHz handhelds receive Police/Fire on 154-158 MHz with direct frequency readout. Hear NOAA maritime coastal plus more on 160-164 MHz. Converter mounts between handheld and rubber ducky. Feedthru allows simultaneous scanning of both 2 meters and Police/Fire bands. No missed calls. Crystal controlled. Bypass/Off switch allows transmitting (up to 5 watts). Use AAA battery. 2¼x1½x1½ in. BNC connectors.

MFJ/BENCHER KEYER COMBO

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The best of all CW worlds- a deluxe MFJ Keyer in a compact configuration that fits right on the Bencher iambic paddle! MFJ Keyer - small in size, big in features. Curtis 8044-B IC, adjustable weight and tone, front panel volume and speed controls (8-50 WPM). Built-in dot-dash memories. Speaker, sidetone, and push button selection of semi-automatic/tune or automatic modes. Solid state keying. Bencher paddle is fully adjustable; heavy steel base with non-skid feet. Uses 9 V battery or 110 VAC with optional adapter, MFJ-1305, $9.95.

VHF SWR/WATTMETER

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Low cost VHF SWR/Wattmeter! Read SWR (14 to 170 MHz) and forward/reflected power at 2 meters. Has 30 and 300 watts scales. Also read relative field strength. 4x2x3 in.

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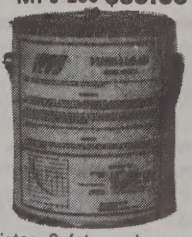

Tune up fast, extend life of finals, reduce QRM! Rated 1KW CW or 2KW PEP for 10 minutes. Half rating for 20 minutes, continuous at 200 W CW, 400 W PEP. VSWR under 1.2 to 30 MHz, 1.5 to 300 MHz. Oil contains no PCB. 50 ohm non-inductive resistor. Safety vent. Carrying handle. 7½x6¾ in.

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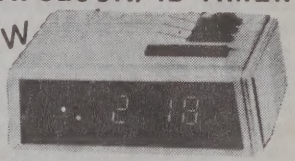
MFJ-106 **$19.95** *NEW*



Switch to 24 hour UTC or 12 hour format! Battery backup maintains time during power outage. ID timer alerts every 9 minutes after reset. Red LED .6 inch digits. Synchronizable with WWV. Alarm with snooze function. Minute set, hour set switches. Time set switch prevents mis-setting. Power out, alarm on indicators. Gray and black cabinet. 5x2x 3 inches. 110 VAC, 60 Hz.

DUAL TUNABLE SSB/CW/RTTY FILTER

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Dual filters give unmatched performance! The primary filter lets you peak, notch, low pass or high pass with extra steep skirts. Auxiliary filter gives 70 db notch, 40 Hz peak. Both filters tune from 300 to 3000 Hz with variable bandwidth from 40 Hz to nearly flat. Constant output as bandwidth is varied; linear frequency control. Switchable noise limiter for impulse noise. Simulated stereo sound for CW lets ears and mind reject QRM. Inputs for 2 rigs. Plugs into phone jack. Two watts for speaker. Off bypasses filter. 9-18 VDC or 110 VAC with optional adapter, MFJ-1312, $9.95.

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ve3bmv Radiotorial

As we are on the threshold of a new year, the time has come to reflect on the past and to think about the future. Many new year's resolutions are made such as to quit smoking, lose 25 pounds, promises to do this and that. DXers and contesters promise to add a few new countries or maybe brake some records. Not the kind that go around and around, but world, continental, country or even hometown records in a favorite contest are a definite possibility in a new year's resolution.

Whatever your promises, do what you enjoy doing most. It will help your mental stress situation. Many hams, especially those who are working for big corporations or are overloaded in their business, find that playing with their radio toys is a balsam on their stress filled system. Especially those who happen to have an idiot for a boss, find it most satisfying to go in the contest and show the world that they are the best. Doctors tell us that the biggest killer among mentally active people is stress. Ham radio can help to relieve that stress, because it is a form of active relaxation. But, it has to be done with a certain amount of moderation, otherwise even this "relaxation" can become a source of stress. The important thing is to try switching between your activities. If you do a lot of sitting on the job, get out and work on the antennas or chase a radio fox. On the other hand, if your job is physical work, sit down and tune the bands.

From my own experience I can say that stress is the worst enemy a normal "healthy" person encounters in his active and most productive years. Fortunately, I realized that in time and quit the "Big Blue" (IBM) when things got out of hand. My health improved and the heart problem I had developed, disappeared. My blood pressure is down and I feel great. I am working a lot harder than before, but I am happier knowing that I am reaching out for my own dream. If you are in a stressful situation, don't hesitate to take corrective action now, before it is too late.

Another interesting thing that many of you might have thought about, is the selection of a new car. The market is now flooded with all those small, cute import and domestic cars that go from zero to sixty in no time, have front wheel drive and are easy on gasoline. Being a mechanical engineer, when I looked at some of those modern marvels, one thing hit me right away - they are coffins on a wheels. Gone is the chassis and the beams in the body. Gone is the rear wheel drive which gives more strength to the body. Although you do get a bit more room inside the car, you also get less metal on the outside. As a result, the ride feels like sitting on a horse's tail. The car is light and bounces down the road like a yo-yo. Accidents are not fender-benders anymore. The cars end up looking like accordions. Rescuers have to cut the bodies out. The car is usually a write-off. The price? Life, higher insurance rates and a difference of about $2 per tank full of gas. The newer engines run at a higher RPM (two to three times the rate of the old V8's), therefore they will not last the "good old" 140,000 miles. So, I recommend buying the good "old fashioned" bigger car with rear wheel drive and a small V8 engine. You will be less tired from driving and most important of all, you might live longer.

At this point you might be asking: "What does this have to do with ham radio?" Well, it saved my life twice (I am a ham, right?). If I can help saving at least one more life, it is definitely worth mentioning here. Who knows? We might have one or more hams living longer, reading our magazine and thanking us. Incidentally, I just heard a very cute song on the radio about a "little Japanese car..." which says it all. So, take it easy and drive the safest car you can find. We want you to be our reader for a long time!

Presently, we are somewhere around the bottom of the sunspot cycle. Take advantage of it and work all your low band stuff, especially for our DXCA credits. The good propagation on low bands will last for another year or two. This is the time to set good contest records on low bands. When the sunspots get higher, everybody is on high bands and activity on low bands suffers, even when the propagation is there. We will continue our coverage of low band activities and techniques, but with more emphasis on high band operation and antennas. We will have a number of articles on antennas that are super performers even at low heights. I will finally have the time to describe my Razor Beams, from the three element quad to the seven element Razor. So, stay tuned.

Here at the home of RADIOSPORTING, we are still working our way through the dust and the paint making this place livable. After the New year, we should be more or less finished with the rough work and have more time to take care of business and RADIOSPORTING. Further improvements on the graphics and the content are in planning. So don't go away, renew on time.

Thank you for your support and comments. It is flattering to hear you say that we are the only magazine you read cover to cover. Even though we are still about 20 percent from where we would like to be, we are working hard towards our ultimate goal. We like RADIOSPORTING to be your magazine and the programs we sponsor to be your programs. Tell us what you want to see in the magazine. If you have questions or problems, let us know and we will try to help. We are fortunate to have the world champions and contributors that really know their stuff. There is no board of idiots here to fight. Just knowledgeable old radio tigers willing to help you to enjoy your hobby and a sport. We will keep you interested and posted on the latest. I am sure that many found the price of subscription is well worth it. Please don't keep it secret; tell your friends about our little magazine. Send for a Christmas gift subscription to RADIOSPORTING for your friend.

Thank you for putting up with us. Please excuse the gap (the October and November issues were not published) and the occasional goof, typo or syntax error. We will eventually get things smoothed out.

We remind all our readers and contributors that we have moved and our new address is listed on the back of the issue, please update your records!

We wish you a very happy holiday season and a healthy, peaceful and prosperous 1987! de Yuri

DX news

A8, Liberia
Liberian amateurs will use the A8 prefix through the end of the year. QSL A8 contacts to N5GAP. Donations go to humanitarian foundations in Liberia.

BY9GA, China
from zone 23 active around 14226 at 2345Z.
BY1PK is active on RTTY, 400 Hz shift, around 14090 at 2330Z. QSL Box 2654, Beijing, PRC

3G9SBY, Chilean Antarctic
from the base Yelcho on all bands including 160 m plus satellite, RTTY, Amtor, etc. QSL via LU8DPM. Mario also is a QSL manager for: 3C1LCK, LU3DXB, CE3AD, ZP5LHY, CE3FTV, LU2E, ZPØJCY, etc.

CXØXY, Uruguayan Antarctica
The same group who organized the DXpedition to Flores Isl. CVØU in December 1985 has now authorization to operate from Uruguayan Antarctica, South Shetland Isl. in February 1987. The exact date will depend on the transportation arrangements by the Uruguayan Air Force.
The following CX operators will take part: CX1AL, 1CO, 1BS, 1DY, 1TE, 1BBL, 2CL, 2CS, 2AAL, 3AN, 4CR, 4AAU, 4HS, 5AO, 8AC, 8CG, 8CF, 8BZ. QSL manager is CX2CS.

C56/6W1NX, Gambia
was to be active Dec. 25 - Jan. 4 on all bands with TS-430S into dipoles. QSL via JA1LFR.
A major DXpedition was to be mounted by G4LJA, G4PCB, G4RUT, G4WJZ, G4YPU and G4URW from Dec. 10 to 18. They were to operate 160 through 10 m each signing their calls /C56.

D68WB, Comoros
is active on 14165 and 14192 between 1900 and 2000Z. QSL to William Barnett, B.P.540, Motoni, Grand Comore, Rep. Fed. Is. des Comores, via Paris France.

FH/W6KG, Mayotte
Iris and Lloyd Colvins fired from Mayotte with Iris doing more of the operating. Their next stop is to be Comoros, D68 and then from Seychelles, S79.

FK/F6BFH, New Caledonia
Alain, F6BFH (one of Clipperton operators) was to operate from FK Dec. 16 - 26 and from Tahiti Dec. 27 - Jan. 3 QSL to his home addr. 21 Rue de la Republique, 76420 Bihorel, France.

FR5AI/T, Tromelin
Hoarau Yoland, FR5AI will spend a month on Tromelin on March 2 to April 2, 1987. He will operate 15 and 20 meters into a dipole. In September he will try for Europa Isl. QSL cards to St. Francois PK-4, 97400 St. Denis, Reunion Isl, via France.

FT8WA, French Antarctica
made it on the air and happened to be on the same frequency with VP8WA at the same time, unable to hear each other. Some DXers who worked one of the station will find themselves in both logs.

FT8XD, Kerguelen
should be on the air very soon.

KL7LF/KH3, Johnston Island
Joe will be stationed there for about one year and expects to be active on all bands 160 - 10 meters, including RTTY. QSL via KL7VZ.

KC6DS, Eastern Carolines
is operating from KC6JC and plans to fire up on 160 m.

KP2N, Virgin Isl.
recent CQ WW CW operation QSL via K8OHC.

KP5, Desecheo
Bob Scilia, NP4TP has a license for Desecheo and is looking for operators for a trip during Christmas holidays.

LU/Z, South Shetlands
Hector, LU6UO will operate for two months from 25 de Mayo Island in the S. Shetland group from Jan. 10, 1987. He likes 3505, 7005, 14020, 21020 and 28020 kHz. QSL to Group Argentino de CW, Carlos Diehl 2025, 1854 Longchamps, Buenos Aires.

S79HWH, Seychelles
Willie will make CW contact on request.

TT8AQ, Chad
Eric works 40, 80 and 20 m SSB in his evenings and on weekends. His home call is FD1JKK, QSL via F6EYS. He will be there until February.

T3ØAT, Kiribati
Alan is packing up his station and heading for VK6. If you need a card, QSL now to G4GED, he will stop answering cards when he runs out of the present supply.

T5ØDX
QSL cards to I2JSB, Giorgio Savani, Via delle Primule 14, I-25056 Ponte di Legno.

VKØDA, Heard Isl.
is now operational. Check Jim Smith net on 14220 for more information.

VK0GC, Macquarie Isl.
Graham is back on the island and Sojo, VKØSJ will be staying a couple of more months, so you have more than your usual shot at this isolated spot

YI1BGD, Iraq
is active on 7003 at around 0100Z. QSL to the operator you work as given on the air. Each operator QSLs his own contacts.

YVØ, Aves Isl.
a major DXpedition is planned by a group of YV operators for March 1987. They will be signing 4MØARV.

G3JKI/5A, Lybia
QSL cards for this operation are now accepted by the ARRL for DXCC as of Nov. 1.

8Q, Maldives
Joe, WA6VNR and his wife Nancy, KB6MME will operate from several spots in the Indian Ocean this Spring, including the Maldives. They will be also on 80 m providing the antenna situation permits it.

9N, Nepal
Four members of the Japan UNICEF Ham Club were to stay in Nepal Dec. 23 - 29, to establish a ham radio station for local boy scouts. They were hoping for individual callsigns, such as 9N5HCK license one of the group received during their visit in August. If not they will guest operate 9N1MM and 9N1MC, including low bands and RTTY.

9Q5TV, Zaire
was operated by Tom, NW Nov. 28-29 on SSB. He had no key, or he would have entered the contest. (Couldn't make one? ed.) QSL these contacts to KC4NC. Tom expects his own 9Q5 license soon.

The above information is from The DX Bulletin, Frankford Radio Club Bulletin, LU8FAO, LU8DPM, CX2CS.

YASME DXpedition

We started our current six months YASME DXpedition on October 3 by flying from San Francisco, CA, to the country of Mauritius in the Indian Ocean: We had thought that we could obtain licenses there but the answer was NO. We tried everything that we could think of, but they are not issuing licenses to foreign amateurs at the present time.
We then went to the island of French Reunion for which we hold license direct from France. We arrived there just before the CQ WW DX contest: We really worked hard to find a place to live, install our station and get on the air.
Two local amateurs were of great assistance, Guy, FR5ZG, and Herik, FR5DX.
The contest was a big help getting started with lots of new countries worked. We use call FR/W6QL. We closed station 16 November 1986 with some 8000 QSOs with amateurs in 148 countries. We operated CQ and SSB on all bands, 10 through 160 m.
Our next stop is Mayotte Island and our call will be FH/W6KG. All QSLs go to Yasme Foundation, PO Box 2025, Castro Valley, CA 94546.
73 & 88, Lloyd, W6KG and Iris, W6QL, Colvin.

TDXB
The DX Bulletin now edited by Chod Harris, VP2ML has improved noticeably since Chod took over. TDXB frequently includes Special Report covering the happenings in the world of DXCC. It brings the fresh, up to date information weekly.

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DXCA AWARD
Take notice of our DXCA award for working 100 countries on single bands and 6 bands and up. See the rules on the back of this issue.

160 m Bulletin

Founder - Stew Perry, W1BB

Top Band News Americas

Dennis Peterson, N7CKD

4248 A Street SE, Sp. #609, Auburn, WA 98002 Tel. (206) 833-7243

HPF (highest possible frequency)
LUF (lowest usable frequency)

PREDICTIONS FOR HPF/LUF USING YOUR HOME COMPUTER

There is quite an interesting and useful program for determining the optimum times of operating 160 and 75/80 meters. Since I began using this program and experimenting with it about 3 weeks ago, I have noticed a great deal of accuracy in its calculations. Using the solar flux readings from the last year, converting them to a sunspot number and plugging them into the program where required, I was able to compare the DX stations that I worked last year with the times recorded in the log book with those generated by the program. The results were quite astonishing, as I found them to be very reliable and close to the times actually worked.

This program was written by E.L. Devereux, G3CCZ and D. Wilkinson, G4LEH. The program is written in Basic language code and requires no data. When I received the program listing from Joe Reisert, W1JR, there were approximately 150 lines of text to be typed into the computer and saved to disk. After entering the program and running it I found that several errors existed with my computer. As I have the Commodore 64 personal computer, there were 6 lines which required changing a comma to a semi-colon in order to get the program to run properly. Also, changing the latitude and longitude co-ordinates to my own here at Auburn, Wa. (lat--47.18 & lon--122.13) seemed to allow the program to function better. There are a couple of other lines in the program which need to be changed to aid in the correct beam headings for short and long path operations of the other HF Bands. Aside from these changes, no other alterations are necessary.

The authors of this program have used the MiniMuf as a starting point, and have simply modified it to cover long-path routes and extended it to include the lowest usable frequency (LUF) predictions. The extension of this part of the program amounts only to 30 lines or so. The only requirements for using the program are the insertion of the latitude and longitude of the distant point when instructed to do so on the screen, together with the month and sunspot number. If the longitude difference is more than 120 degrees the program will request whether the long or short route is required. It will then print to the screen the highest possible frequency (HPF) and (LUF), at one hour intervals of universal time (gmt) throughout the day.

The only problem with the program right now is that it does not contain any means for a hard copy printout. Another area that would be nice to incorporate into this program is a sequential data file of lat/long coordinates of major cities of the USA and the major countries of the world to automatically be read and inserted when the program asks for the current route you are interested in working. For instance, when it asks Route? If you were to reply with LZ, the program would begin an automatic search in the data files and pull out Bulgaria 42.7N lat & 23.3E long. The only reason why I want to try and incorporate this into the program is that I don't like the idea of looking up the coordinates for the area I'm concerned about.

With a data file of all these coordinates built into the program, it would give considerable flexibility and ease of use to the program. Maybe someone already has done this. The program was originally published in RADIO COMMUNICATIONS March 1983, and therefore credit should be given to the authors and the magazine for usage in RADIOSPORTING. If anyone has used or modified this program on the Commodore 64, I would certainly enjoy hearing from you and what you did to make the program better. I am sending the photocopy of listing of this program to Yuri, VE3BMV/W2, and I can supply the disk version of it. So if anyone desires a copy of the disk or the Xerox copy, you can contact either Yuri or myself at the addresses listed in the magazine.

There is still another program available for predicting muf/hpf/luf through a program called Micrmuf +2. This program I haven't had much of a chance to use or examine. Inasmuch as I am not a computer programmer or computer genius, I have to learn the ins and outs and what causes the program to function as it does through experimental methods and by using a cross-reference program to see just how it functions. In summary, everything you can get your hands on as far as helping predict optimum operating times and what band is going to offer you the most affordable conditions is to each and every individuals benefit. Try these computer programs and see for yourself.

PREVENTIVE MAINTENANCE

Believe it or not, Mother Nature has a strange way of making things perform unsatisfactorily. In a recent check of the equipment and my antenna system I found the SWA antenna damaged. Apparently cold and humid weather mixed with hot and dry during the past summer have taken their toll. Many connections became loose, wire got pulled out of the terminals, etc. Inside of metal enclosure number of solder connections had to be repaired. I began to wonder about my antennas, when I heard that Stan, W7AWA/OX heard me several times, but I could not hear him. I have heard Stan at other times, but he could not hear me. The best evening/morning opening was when Bill, WØZV and several East Coast stations worked him. So it pays to keep the antenna hardware in the top shape.

Here is one helpful hint to ensure good connections in the antenna hardware. I use a product KOPR-SHIELD which is a conductive, anti-corrosion surface treatment. It is manufactured by the Thomas & Betts Co. in Elizabeth, NJ. Some of the features are:

1. Prevents seizing of threaded fittings.
2. Seals out moisture, corrosive fluids and gases in threaded confinements.
3. Protects against corrosive solutions.
4. Assures low resistance contacts.
5. Improves ground conductivity.
6. Lower torque resistance.
7. Contains finest rust and corrosive inhibitors.
8. Easy to apply and will not run or drip.

KOPR-SHIELD literally "copperplates" the mating surfaces to improve conductivity or ground conductivity. Its use is recommended on: fuse clips, raceways, underground connections, taps and lugs, grounding clamps, slip rings, wiping contacts, drum switches, battery lugs and cables, bolted connectors, bus bars, lug torques, compression connectors, lamp sockets, studs, bolts, nuts and all piping.

This product provides leak proof makeup, reduces hot spots, arcing and assists in the dissipation of coronas. Virtually eliminates oxidation and formation of carbon path. Improves the conductivity, stability and ultimate life of electrical connections. This product comes with its own built in applicator (small brush on the cap) for applying the material to the surface.

I hope you will find this useful in your battle against the corrosion and bad connections in your antenna system.

160 WAZ UPDATE

G3SZA and PA0HIP have both worked 39 zones and had them confirmed as of Sept. 8, 1986. The only zone needed by both is zone 26, which was recently represented by HSØC. Both Dave and Willem have missed this operation. We hope that they perhaps managed to work the HS station during the CQ WW. Station in HS land at this time are only authorized to operate during the major contests.

The latest standings in the 160 WAZ:

1.	G3SZA	Dave Wilson,	39/39
2.	PAØHIP	Willem Morsink	39/39
3.	K5UR	Rick Roderick	35/35
4.	WØZV	Bill Tippett	35/35
5.	DJ8WL	Peter Bobek	32/32
6.	LZ2CJ	Wally Stefanoff	32/32
7.	N7CKD	Dennis Peterson	27/27
8.	VE7BS	Bob Eldridge	25/24
9.	?		

The race is heating up, CQ Magazine has announced the special 160 meter version of the WAZ award. Who is going to be the first one to achieve this prestigious award? Is there any black horse in the running? Check your records, you might be further ahead than you think. Please drop a note about your standings to me or Wally, LZ2CJ.

Another remarkable accomplishment is that of Bill, WØZV: he worked DXCC in less than a year and has 165/162 countries during two year period. Increased activity and better equipment are making this goal obtainable.

When chasing W7AWA/OX I had a considerable amount of static crashes, but with the newly modified front end of my FT-101E and cascaded filters using Autek QF-1A, The model 10 Hildreth, and the Bencher XZ-2 Filters I can finally hear signals that were once inaudible. Maybe I will complete my DXCC this year. I believe W7AWA/OX is running 100 W into a short 60 ft. vertical. His location is very quiet and hears quite well.

KH9AC from Wake Island is active most mornings from 1000Z to 1300Z. Look for him in the window 1827 and he is listening at 1823.

KX6DS is still active on 160 around 1825 kHz. Look for Dave late evenings or early morning hours.

VK9XI should be active from Norfolk Isl. as should VK9NS also.

Letter from
Margaret Perry, XYL of W1BB

During the past several months I have received letters and cards from many operators asking about Mr. 160 - Stew Perry, W1BB. I decided to write to Stew myself and find out just how he is doing. Unfortunately, Stew is unable to write these days due to his eye disease and poor health. I would like to share the content of the letter from Stew, written for him by his wife Margaret:

Dear Mr. Peterson;

Thank you so much for your fine letter sent to my husband, Stew Perry, in September. We appreciated the nice things you said about him. (Mr. 160)

Unfortunately, at the present time he is in a nursing home because of the specialized care he needs for his Trachestomy Care and tube feeding. However, he is up and dressed each day, and can walk about a bit. I go to see him every day in a nearby suburb, Asdren-Normandy Home N.H., 15 Green Street, Melrn, MA 02152. His original problem was a Neurological breathing one, and not a growth, so we don't have to bother to worry about. Pleased you are continuing interest in 160 even though you had to give up your "West Coast 160 Bulletin." Glad you are still sharing your interests and writing for RADIOSPORTING magazine.
Best wishes from
Margaret Perry
(Mrs. Stew Perry)

(How about sending a get well cards to Stew, W1BB?

In order to honor Mr. 160 - Stew Perry, RADIOSPORTING will sponsor a trophy in his name for the highest scoring station on 160 meters, combined phone and CW, from North America in our IRSA World Radio Championship contest.

de VE3BMV)

Latest activity on 160.

This listing is taken from the past few issues of The DX Bulletin edited now by Chod Harris, VP2ML:

4X4NJ	1842	0355	24	MA
5T5XX	1831	0225	28	CO
5T5XX	1830	0608	27	MA
9Y4DK	1826	0147	23	WA
9Y4XX	1832	0320	27	WA
CO2PY	1830	0505	28	MA
D44BC	1840	0405	24	IL
EA6NB	1833	0634	1	IL
EA8QO	1832	2318	23	MA
EA8XS	1839	0654	23	WA
FG5AM	1832	0321	3	FL
FY5YE	1838	2153	23	MA
GD4BEG	1833	0707	22	IL
GI3OQR	1838	0647	22	WA
HB9CXZ	1842	0653	23	WA
HC1BI	1838	0345	23	MA
HI8LC	1825	0218	5	FL
HK1QQ	1836	0302	22	RI
HL9CW	1806	1440	24	WA
JA1CGM	1909	1151	21	RI
JA6VAT	1911	1404	22	WA
KG4XO	1834	0845	23	WA
KG4XO	1838	0345	21	WA
KG4XO	1834	0350	28	MA
KH6AT	1831	0629	22	WA
KH6CC	1830	0640	21	WA
KL7GKY	1827	1827	23	WA
KL7U	1833	0722	21	WA
KP4DJ	1836	0220	4	FL
VP8HD	1835	0458	22	WA
VS6DO	1825	1227	24	IL
XE1VIC	1839	0847	25	RI

RADIOSPORTING REWARD

RADIOSPORTING is sponsoring its subscription drive. The reward is extension of subscription by one issue for each new subscriber sponsored.

Tell a friend about RADIOSPORTING and encourage him to subscribe. If he does so, he should mention your call sign on his subscription application: "Sponsor: W1ABC." RADIOSPORTING will automatically extend the sponsor's subscription by one issue for each new sponsored subscriber. No special forms required, just make sure sponsor's call is mentioned.

YOU DON'T HAVE TO BE A DXER OR CONTESTER TO ENJOY RADIOSPORTING!

Our new address:
Box 282
Pine Brook, NJ 07058 USA

QSL routes

A22BW	—DK3KD	KH6JEB/KH7	—KH6JEB
A35JF	—G4AAL	KH9AC	—WK6T
A35KL	—ZL4QS	LAØFH	—WA3YJA
C30AAN	—DL8OH	PA6SVK	—PA3DTD
C53FG	—G4WOF	PJ0J	—K4PI
CP8XA	—DL3NAZ	TZ6WC	—DL4BC
CYØSAB	—VE1CBK	UP9A	—UP1BZZ
DK7PE/KH6	—DK7PE		*(See Note 5)*
DPØGVN	*(See Note 1)*	V31CV	—NA5S
ED5TI	—EA5BYP	V31DX	—N5DD
FO5FO	—F2BS	VP5DG	—KA5RGE
FOØASJ	—N5DD	VP8PTG	—G4RFV
FOØMIR	—N5RM	VQ9AM	—N4GNR
FOØXA	—F6GXB	VR6H1JL	—G4AAL
FP4CJ	—F6FNU	VR6NP	—G4TAW
FT8YA	—F6DZU	Y61Z/p	*(See Note 6)*
GB2TV	—G4XEW	YW1A	—YV1TO
GB9DB	—G4AYM	ZD8SB	—G4KIV
GM3YOR/4S7	—GM3YOR	ZD8SW	—GØDFW
HD8G	—KT1N	ZD9BV	—W4FRU
HFØPOL	—SP5PWK	ZD9CA	—KA1DE
	(See Note 2)	ZF1GC	—VE4XN
HG1W	—Bureau	ZK1XM	—KB1CM
HG5A	—Bureau	ZK1XV	—VK2BCH
HG6N	—Bureau	ZL6A	—Bureau
HG7B	—Bureau	ZX7SM	—PR7AA
HG9R	—Bureau	3D2CW	—DK7PE
HL9YG	—N4GNR	4N9S	—YU2CBM
HS4ANH	—OE2DYL	5R8JD	—TU2NP
	(See Note 3)	5T5HL	—DL8DF
IK8GGQ/ID8	—I8NSK	5T5SL	—DL4VC
J28EM	—W4FRU		*(See Note 7)*
J73A	—N6CW	5W1DZ	—WB2LVB
JG1FVZ/6N1	—JF1EEK	6K86AG	—HL Bureau
JW6WDA	—LA5NM	7J1ACH	—NG7X
JX8KY	—LA8KY	8O2FTJ	—A22TJ
	(See Note 4)	8R1Z	—WI4K
K8UNP/PJ7	—K8UNP	9X5WP	—WB6VKD

BY4SZ	—P.O. Box 51, Suzhou, PEOPLE'S REPUBLIC OF CHINA
CP6JX	—P.O. Box 82, Santa Cruz, BOLIVIA
FK8FF	—P.O. Box 4204, Noumea, NEW CALEDONIA
PJ9MS	—Angus Murray Stone, All Saints Rectory, Heelsumsestraat, Curacao, NETHERLANDS ANTILLES
TA2G	—P.O. Box 14, Emek, Ankara, TURKEY
TA2N	—45 Tunas Sreet, Ankara, TURKEY
TA2S	—45 Tunas Street, Ankara, TURKEY
TA4A	—P.O. Box 88, Aydin, TURKEY
TF7PS	—P.O. Box 90, Hveragerdi 810, ICELAND
TJ1AP	—P.O. Box 50, Mbalmaya, CAMEROON
TU2BU	—Albert Curley, Department of State-Abidjan, Washington, D.C. 20520
TZ6MG	—Eddy Lelivelt, Drontermeerstraat 70, 8226 HL Lelystad, NETHERLANDS
V85DU	—P.O. Box 989, Gadong, BRUNEI
V85HT	—P.O. Box 222, BSB, BRUNEI
V85IR	—P.O. Box 85, Gadong, BRUNEI
V85RM	—P.O. Box 191, BSB, BRUNEI
VP8BKT	—P.O. Box 260, Mount Pleasant Airport, FALKLAND ISLANDS
VQ9BP	—P.O. Box 3152, Spartenburg, SC 29304
Y86WCS	—P.O. Box 118, Ilmenau, GERMAN DEMOCRATIC REPUBLIC
YJ8RG	—P.O. Box 323, Sarina, Queensland 4737, AUSTRALIA
YN4RC	—Bob Walsh, Casa La Salle, Apartado 78, Bluefields, NICARAGUA
ZK2JB	—P.O. Box 181, NIUE ISLAND
5J0FRC	—P.O. Box 1767, Bogota, COLOMBIA
9M6AE	—P.O. Box 10777, Kuala Lumpur, MALAYSIA
9M8GH	—P.O. Box 2870, Kuching, Sarawak, EAST MALAYSIA

Notes

1. For contacts made after March 1, 1986, QSL cards may be sent via DL2NF. For contacts made prior to that date, send your cards to DJ4SO.
2. Another route was also given for HFØPOL: P.O. Box 298, Warsaw, POLAND.
3. Cards for HS4ANH may also be sent via OE2REL.
4. Cards for JX8KY go to LA8KY via the Norwegian QSL Bureau.
5. As for all Soviet stations, cards must be routed via P.O. Box 88, Moscow, USSR.
6. Cards for this one may be routed to Y25ZO via the bureau or Y39XO direct.
7. A stateside manager is also given for this one: W4FRU.

Tnx Worldradio

80 m DXing

John Devoldere, ON4UN, AA401

The GRAY LINE TOOLS.

Last month I received a review copy of the Grayliner from Dale, K6UA. To my knowledge, K6UA was the first to describe the Gray-line propagation on the low bands in an article in CQ magazine in September, 1975. Although the effects of the Gray-line were known by many low band DXers long before, neither the phenomena nor the mechanism were described before in detail. Since then Grayline prediction tools have been made available from different sources. The most accurate ones are based on numerical data, either produced by a computer program or listed in a computer generated print-out. The accuracy of the numerically produced data depends on the accuracy of the used algorithm. A very accurate algorithm has been published by Brolini, NS6N (DX-ing by computer, Ham Radio, August, 1984), while astronomically correct algorithm will be published in my new book "Low Band DX-ing". New Sunrise-Sunset Tables will be made available, and will use this algorithm. Data are printed for half month intervals, whereby, through linear interpolation, an absolute accuracy of plus minus 1 or 2 minutes can be achieved for a latitude of 50 degrees. It is obvious that the accuracy will be better at lower latitudes, and worse at higher ones. Using the algorithm on a computer will yield extreme accuracy. Software that yields this accuracy is available on diskette both from Brolini, NS6N, (DX-1 and DX-2 at $19.95 and 39.95 respectively), and from ON4UN (either directly or via K7KI, for DOS 3.3 operating system, CPM or MS-DOS; the price is $19.00). The sunrise/sunset program is part of a collection of 30 programs all dedicated to the low band DXer, partly consisting of propagation tools, and partly of low-band antenna design tools.

The Grayline globe, produced by Colombus Verlag (D7056 Weisntadt/Beutelsbach West Germany, order number 43 34 52-9) costs approximately $100.00 including air freight to the USA, and is probably the best visual system around. It gives the full three dimensional view of the earth, with the terminator that can be set with an accuracy of 1 calender day and within a few minutes. Comparing the results with the astronomically correct algorithm yields an accuracy ranging from -12 to +30 minutes, measure at a latitude of 50 degrees. The limited accuracy is only due to the fact that the grayline projecting mechanism does not take into account the deviations caused by the slight ellipticity of the earth's orbit around the sun. The globe is an ideal tool to interpret odd (non great circle) propagation paths, which are difficult, not to say impossible to visualize on maps.

The DX-EDGE ($16.95) is probably the most popular of all Grayline tools, and is in use not only by Low-Band DXers but by many HF DXers. I remember using a home made DX Edge like tool about 20 years ago, but at that time never thought of commercializing it. The DX-edge has a limited degree of accuracy however. The double (side by side) world map does not show the country boundaries. Unless the user's knowledge of geography is way above average, he will have considerable difficulties to locate the "target" QTH for which he is trying to determine sunrise or sunset time. When the location of interest is accurately situated on the rudimentary map, the typical accuracy is plus or minus 15 minutes for latitude of 50 degrees. When the "target" QTH has not been carefully pin-pointed, the error can easily be plus or minus 30 minutes or more. This may be good enough for many applications, but barely good enough for the dedicated 160 meter DXer who wants to have that information with an accuracy of a few minutes at worst!

I guess K6UA has since long realized that the DX-Edge could be improved, both from an accuracy as from an operating convenience point of view. His Gray-line overlays, activated by a drum transport system. The map shows quite clearly all country boundaries and is printed in multi-color. Situating the target QTH has become like child's play. The whole system is housed in a wooden cabinet measuring 10.6 by 8.7 inches. The zero degree meridian is clearly indicated by a red line so that reading GMT time is quite easy (this line is missing on my DX-Edge). A practical test showed that for a well identified target, the accuracy is of the same order of magnitude as for the DX-Edge. Where important improvements are to be expected is in the exact locating of a target QTH. All by all the practical average accuracy is twice better than with the DX-Edge. This is a considerable cost premium however ($49.95).

Both the DX-Edge and the Grayliner which I have shown have similar problems: accurate alignment of the overlays on the map is difficult or not possible. The DX-Edge overlays show the equator printed which helps with the proper alignment of the overlay on the map, which has also the equator printed. Several of the DX-Edge overlays I have cannot be slid in the map guides, because the contours of the overlays have been very inaccurately cut. The height of the Grayliner overlays for the different months vary with as much as 0.1 inch,a nd they do not fit snugly into the wooden slot of the Grayliner, which seems to be slightly too large (0.06 inch) for a perfect fit with the largest overlay. On the other hand, the slot on the back of the Grayliner is too tight to house the overlays not in use. It took me 5 minutes to get them all out after I received the review sample. As the equator is not printed on the overlays, manual alignment with respect to the underlaying map is impossible with the Grayliner.

The improved (faster) version of computerized DX-Edge ($27.95) which I reviewed some months ago, may be spectacular at first view, but is not at all practical in real life. The system is extremely slow, and I found a number of very inaccurate coordinates of several locations in the data bank. All by all, a mere gadget.

What do I use? I have the Grayline globe, while the Sunrise/Sunset tables and the sunrise sunset program which I run on my Apple computer are used when additional accuracy is required.

All of this month's subjects are covered in much

INTERNATIONAL RADIO SPORT ASSN.

BOX 65, DON MILLS, ON. M3C 2R6 CANADA TEL. (416) 438-6313

25, JUNE 1984

Dear fellow contester,

I think that need for independent international radioamateur contest association is long overdue. I think we need an organization that would represent radioamateurs involved in the sport aspects of our hobby. Most of the magazines cater to the beginner or average ham and do not devote enough space on their pages to the competitive and operating aspects of our activities. There is also growing tension between the contesters and non-contesters. I also feel that there is a need to bring us together and explain and promote our activities and contribution to the art of radio communications.

I hope that by having IRSA - the International Radio Sporting Association we can help to promote sport activities in amateur radio, publicize them in our press and public media and help to improve the quality of our hobby. More about the IRSA and RADIOSPORTING magazine is described in the attached sheet.

I have taken the liberty to get the IRSA off the ground. We need to select and elect the best people, willing to contribute their skills and effort, to the board of directors for IRSA. This would typically require few hours a month to read and answer some correspondence and once a year, for those who can, meet at Dayton Hamvention for the annual meeting and symposium. At the beginning we are asking leading operators to join the executive committee and basically volunteer to do things according to their possibilities. The elections for the next term will be carried at the 1985 Dayton Hamvention.

We are asking that the executives will pay the initial fee of US$ 12.- to cover the cost of certificates and badges. The executives will receive life membership as a reward for the work they are putting in, there will be no renewal fee required.

Money collected for IRSA membership will be used to fund the International Contest Symposium at Dayton, mailing expenses, trophies and awards sponsored by the IRSA, Contest Hall of Fame, travel expenses for the special award winners as decided by the executive committee and funds permitting. Any donations towards above mentioned activites would be greatly appreciated. You might try to solicit contributions from manufacturers and dealers of amateur radio equipment.

Amateur radio has meant a lot to me, it has helped me in many respects and I find it fascinating and enjoyable. I like to pay my dues to amateur radio by contributing my skills and time to make the IRSA and RADIOSPORTING devoted to excellence in amateur radio and make it better for all of us.

I am appealing to you dear contester and asking you to join us, to be a member of the executive committe and together with other world's leading amateurs, help us to make the IRSA and Radiosporting great success we all can enjoy and appreciate. You have been selected because of your excellent contest results and contribution to the sport of contesting.

Also, if you would like to contribute to RADIOSPORTING or lead a column, please let us know. This could be on monthly basis or every 2nd or 3rd month, whatever suits you.

I hope to hear from you very soon, we are preparing a roster and the first issue of Radiosporting and would like to include you in them. Also a picture of you and brief summary of your professional and radioamateur background would be appreciated.

I am looking forward to our cooperation and we will be honored to have you aboard!

73

Yuri Blanarovich, VE3BMV

greater detail in LOW-BAND DX-ING, to be published soon by the ARRL.

"NEW" LOW BAND ANTENNA

Last month I discovered a new Low Band antenna. It was not April, was it? Anyhow, a friend sent me a copy of a report on "Buried receiving antennas." The "condensed" form is 30 typed pages long. Thirty typed pages of nonsense as far as I am concerned. The report does not carry the name of it's author. Only one of the figures mentions the call of W7QID, Steve. My friend who sent me the copy, called it an underground Beverage antenna although, it is not called so anywhere in the text. Without going into details, the antenna resembles a buried dipole, the two half elements being made of insulated wire. The outer parts are non-insulated, which serves to ground the elements at the ends. The length of the insulated part of the dipole is approximately 0.033 wavelengths, while the non-insulated grounding tips have roughly the same length. Here is a super receiving antenna barely 0.1 wavelength long! Our XYLs will love it! Can't even see it. The whole system with the feedline is buried 1 to 4 feet under the surface of the ground. The loss of the antenna is claimed to be -30 to -40 dB as compared to a short vertical for 1.8 MHz. You know that a good short vertical can have an efficiency within less than 1 dB of a full size quarter wave vertical. Altogether it means that this new wonder antenna has a pretty low efficiency. It looks to me that even with the best of preamps it will be hard to make up for the kind of loss if we are digging for the weakest DX signal on top band!

Here is what the unknown author writes: "Receiving antennas as a class are small, some types occupying less than 30 feet at 2 MHz. The radiation efficiency is relatively low, and the radiation patterns are omni-directional, bi-directional or uni-directional. The physical arrangement and feed system is relatively simple..." How about that for a general statement about receiving antennas?

Ground conductivity is said to be a primary design parameter, and elaborate ground conductivity measurements are needed before the antenna can be designed. I wonder what happens with a QTH like mine where the ground conductivity changes drastically between autumn, winter, spring (which is very wet), and summer (very dry)?

I have not seen the horizontal or vertical directivity of the antenna described anywhere in the paper other than saying it is bi-directional. Figures quoting lobe beamwidths are missing. As to the wave angle, not one word. However, the article shows arrays of such buried antennas, but omits to give any indication on how to calculate and/or design the required feeding/phasing networks. Based on the information it gives, the whole thing looks like an April Fool's joke. If anyone has more information as to the origin of this Wonder Antenna, please send me the info. I can supply a copy of the condensed form report to anyone interested.

SLOPING BEVERAGES?

I have often been asked the question "what about Beverage antennas on sloping terrain?" As far as I know, this question has not been dealt with in amateur literature. Let us consider the principle of a Beverage antenna. On the ham bands (mainly 160 and 75 meters), DX signals usually arrive at relatively low angles, varying typically between 15 and 40 degrees. Let us imagine a wave front, arriving at 30 degrees angle with the horizon, which induced EMFs onto the conductor of the Beverage antenna. The propagation speed of the induced wave in the wire is substantially lower than or the electromagnetic wave in the air. The velocity of propagation of the wave in the antenna-wire usually varies between 85 and 95 percent of the speed in air. The velocity factor for a Beverage antenna can also be measured, and is frequency dependent. The measuring of the velocity is explained in detail in my book "Low Band DX-ing." Along the antenna wire, as the wave front induces EMFs in the wire, a phase difference builds up between the wave traveling in the wire and the wave which induces EMFs further along the wire. At one point those EMFs start counteracting and subtracting. This is the point where the Beverage length has become too long. Beyond this critical length the output of the Beverage will drop, although its directivity will not deteriorate. This critical length will depend mainly on two factors: first, the velocity factor of the Beverage antenna, and second, the angle of the sky-wave with the Beverage antenna wire. This is where the sloping terrain situation comes into the picture.

If the Beverage, which is mounted on the side of the hill or a slope, is essentially horizontal, the influence of the slope will be minimal. If the down slope is the direction of the target, the angle between the wire and the wave front will be greater than if the wire were horizontal. Accordingly the critical length of the Beverage will be shorter. If the slope is in more than approximately 15 degrees, it will be very difficult to have a properly functioning Beverage antenna. If the slope is a gentle uphill slope towards the target direction, this can however be advantageous for the proper functioning of the antenna. Assume an upwards slope of 20 degrees towards the target, and a wave angle of 30 degrees. This results in an equivalent wave angle of only 10 degrees, which means that, given the same velocity factor of the Beverage, the antenna can be made much longer before the gain will start to drop.

Resuming: Beverages on sloping terrain are alright if the Beverage is horizontal (direction perpendicular to slope direction). If the ground slopes downhill towards the target, you are likely to be in trouble unless the slope is very gentle and the Beverage short (slope less than 15 degrees and length not more than 1 wavelength). If the slope is uphill towards the target, you have a real good situation provided the slope is less than the lowest expected wave angle which is generally 20 degrees. The figures quoted are not absolute and only serve to fix the mind. Well, so much about Beverages over sloping terrains.

I also have been asked a few times if Beverages can be strung non perpendicular to the sloping ground. I tend to say no, unless the slope is gentle (again, less than the slope of the lowest expected wave angle) and the maximum height is not more than 10 feet for 80 meters and maybe 20 feet for 160 meters.

One last question that has popped up now and then was: "Can I make my Beverages of different sections which do not run in a straight line?" If the non straightness is less than a few degrees and if that solves a local topographic problem, fine. But, do not try it with sections that are at an angle of more than 10 or 20 degrees to one another. Some compromising can be accepted but it can not be compromising all over! Happy 1987! (ON4UN)

Ken Miller, K6IR Honored

Kenneth Miller, K6IR was presented with the Radio Club of America's Sarnoff Award at the organization's annual awards banquet in the New York Athletic Club on November 21, 1986.

The award named after David Sarnoff, founder of Radio Corporation of America , is given annually to the person who has made the most significant contribution to the advancement of electronic communication. The Radio Club was founded in 1909 for the interchange of knowledge of radio art.

During his life time career in electronics and related industries, Mr. Miller has been responsible for many technological innovations. A pilot and engineer in the aircraft industry for many years, he developed the first automatic pilot for general aviation use, a life-saving automatic rudder control to prevent airplanes from falling into a fatal spiral and the first solid-state automatic direction finder for planes. With his then boss Bill Lear, he created the first eight track audio tape player and cartridge in the mid sixties.

Before leaving the Penril Corporation earlier this year where he served as President, CEO and Director for 13 years, he was responsible for the development and sales of that company's sophisticated product lines. These included modems, test instruments, digital panel meters, high performance power supplies and stereo systems. He expanded the manufacturing operations from the headquarters plant in Rockville, MD to facilities in nine states and plants in Europe, Japan and Mexico. He increased sales during that period from $ 1 million to $80 million.

Ken is a graduate of the Illinois Institute of Technology and the University of California. He is a licensed pilot and counts flying and international travel among his hobbies.

Ken has been licensed radio amateur for over forty years. From his K6IR radio shack in Rockville, Maryland home he has chatted with King of Spain Juan Carlos, EAØJC, King Hussein of Jordan, JY1, Japanese explorer Naomi Uemura en route to the North Pole by dogsled, Senator Barry Goldwater, K7UGA, and many others in over 320 countries.

The Sarnoff Award singles out Ken Miller for his major contribution in radio communications and in application of electronics to aviation, instrumentation and computers; also for his leadership of the Radio Club's Grant-in-Aid scholarship program.

At K2GL 80th birthday party over 80 operators had a chance to meet each other and exchange ideas. Enjoying 807s are L. to R.: George Briggs, K2DM, John Crovelli, W2GD and Jeff Briggs, K1ZM.

Carrying Big Stick to keep the pileup on the K2GL's hill well behaved is Jerry Mathis, W3GM (left), with Gale Steward, K3ND and Gary "Woody" Woodhouse, K2UU assisting. All present admired the great multi-multi installation at K2GL/N2AA contest station near Tuxedo Park, NY.

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TOP BAND DXing FROM THE FAR EAST

PART 1 - JAPAN

Bill Tippett, WØZV

Have you ever wondered what 160 meter DXing is like in the Far East? I certainly have and recently had a chance to visit several Top Banders in Japan and Hong Kong. The following is being written as I return to Denver from a two week business trip. Arrangements for my visit began about two months ago once I had a firm itinerary. I wrote a brief note to Paul, VS6DO and also talked about it with my friend Saito, JA1XAF who visited me about six weeks ago.

Saito was the first EL (EL2FY) on 160 and some of you old timers may have worked him in 1980-82 while he was on assignment for Fujitsu in Liberia. Saito worked about 100 European stations, 100 Japanese stations and 40 USA stations while on 160 from EL. Saito is now 37 and is a Senior Communications Systems Engineer for Fujitsu which has a couple of major installations in Dallas and San Francisco. Because we both share interests in the low bands, we became good friends and Saito has visited me 4 or 5 times over the past year or so.

I mentioned to Saito several of the "Big Guns" often heard on 160 from the JA1/Tokyo area -- JA1GTF(Ichiban or #1 DXCC total from Japan), JF1NZW, JR1EBE, JA1CGM, JA1CHN, etc. Saito is not currently very active on 160 because he's having too much fun on 75 with his 2 element Creative Design Yagi. However, I think he has been reinfected with "160 fever" so look for him next season. He agreed to contact some of the JA1 Top Banders and set up visits for the free weekend I had in the Tokyo area.

After a busy week with a company sales seminar in Tokyo, I was eagerly anticipating seeing Saito on the weekend. Saturday morning finally arrived and I waited in the hotel lobby with my camera, an overnight change of clothes and my imagination. During the preceding week I had commuted by train between the hotel and our seminar location and had seen many VHF antennas and even a few HF tribanders rising above the maze of multi-story apartment buildings. But how in the world could the JA's put out a signal on 160...not to mention receiving antennas??

Saito arrived as scheduled (as does everything in Japan) and we began winding our way through the train system toward the Tochigi area North of Tokyo about 100 kilometers where he has his station at the home of his parents. Because of the long commute to the countryside, Saito lives with his family in an apartment near his work in Tokyo where large antennas are out of the question. I felt guilty that he had to leave his family for the weekend, especially since he travels so much, but he wouldn't hear otherwise.

As we travelled North, the rows of apartments and houses slowly began to give way to occasional patches of green--small gardens or rice paddies that caught my attention since I also have a big vegetable garden at home underneath my 160 counterpoise. Occasionally tall towers began to appear although all appeared to be self-supporting. Saito explained that guyed towers are very rare in Japan because they require too much land. Towers are fairly common although a construction permit is required for towers in excess of about 15 meters. Since law is generally not a respected profession in Japan, they have not suffered the proliferation of lawyers and lawsuits that we have in the USA. The Japanese Amateur Radio League provides coverage in the event that your 75 meter Yagi falls on your neighbor's house!

Towers of JG1LGZ situated at the edge of a large rice paddie.

Kazu, JG1LGZ is a farmer and Top Band DXer.

We finally arrived at the destination train station although we were about 45 minutes late because we had just missed connecting with a branch of the Bullet Train (top speed 160 mph). Hiro, JA1ATK, was waiting to drive us for an afternoon visit to Nikko Park, a 1200 year old shrine built by one of the Japanese Shoguns named Tokugawa. JA1PEJ and JA1HGI followed us in another car and we kept in touch on 450 MHz as we travelled. The talk turned to the 3C0A expedition which had just shown up the previous evening. Sho, JA1PEJ, was the only local who had made it although Hiro and Saito both needed 3C0 for a new one. I also heard that they planned to be active on 80 and 160--hmmm...I wondered if they would still be active by the time I returned to Colorado July 1st!

After an enjoyable afternoon seeing Nikko (and making a prayer to the shrine for success with the 3C0), we began heading back toward Oyama. Saito suggested that I get a nap because there was a party planned for that evening. I decided to take his advice since I knew that the scenery would be essentially the same as on our trip up earlier.

Later I awoke as we were in a concentrated area of farming--green rice paddies interspersed with ripe bronze wheat and vegetables such as beans, squash, corn and many other plants I didn't know. Soon, Saito pointed out the towers of JG1LGZ.

I had worked Kazu on Top Band earlier this year in January and had a QSL in my briefcase for him. Kazu is a farmer and is situated at the edge of a large rice paddy. Although he had taken his antenna down for the summer, it was an inverted vee up 25 meters when I had worked him. He runs a TS-930S and has monobanders on 40 through 10. He has worked about 40 countries on 160 and his excellent location is obviously part of the reason. We had to cut the visit short to see Toshi, JA1EMK.

Toshi has a fine HF set-up but is not QRV on 160. He had stayed up quite late the previous evening chasing 3C0A but had not been lucky enough to catch him. We had to again cut our visit short to get to the party at a local Sushi Bar in Oyama City.

A JA pileup at the sushi restaurant! Clockwise L to R: JH1ADY, JA1XAF, JA1QOQ, JH1WME, JH1HGI, JA1ATK, JA1EMK, WØZV, JG1IGX, JA1PEJ.

We had a wonderful time at the party with Sushi (raw seafood with rice), tempura (deep fried vegetables and seafood), broiled trout and many other delicacies. Needless to say, this was supplemented with plenty of beer and Sake (rice wine). The master of sushi restaurant seemed to like me and gave me a big glass of his private Sake. He also explained that

The master of the sushi restaurant says anyone who eats fish heads will be successful on 160!

it was OK to eat the head and tail of the trout! I tried both...the tail was great but I cannot honestly recommend the head. I took a brief break from the party to walk to the QTH of Ham, JH1ADY. He had a fantastic professional stereo system as well as several vintage American radios--Drake B line, 75S3B, Heathkit, etc.

Back at the party we continued to have a great time but we finally said farewell after the group presented a traditional pair of wooden clogs for me and my wife with autographs and calls from everyone present.

Saito, JA1XAF, proudly displays two plaques recently received from the ARRL.

We went to Saito's house and after seeing his station, I went to sleep in a Japanese-style bed (cushioned mat on the floor) while Saito stayed up to try to work 3C0A on 15 meters. He finally got him on 20 meters but only got about 4 or 5 hours of sleep that night. Such is the life of a DXer worldwide!

The next day I saw that Saito's location was right next to another house. Can you imagine a 30 meter tower with a 2 element 75 meter Yagi below a 2 element 40 meter beam and another 20 meter tower with HF monobanders all on a small lot? Unfortunately he still has some TVI problems but is not there often enough to have too many complaints.

After a nice breakfast we got ready to head to Mito which is to the Northeast of Tokyo near the coast. This is where we were to see noted Top Banders JA1GTF and JF1NZW. First we visited several of the locals who were at the party including ATK and PEJ. Both had large antennas and PEJ had an especially nice location overlooking a large agricultural area. Everyone offered tea and Japanese

JA1XAF QTH - 75 meter beam is normally under the 40 meter beam on the tower with the platform.

cakes but I finally started refusing in fear that I would become stuffed beyond belief.

We began the long drive to Mito. It really wasn't that far away but the traffic was bad since it was Sunday and the maximum speed limit was 50 km/hr (about 30 mph). I enjoyed the scenery which included lots of farms, forests and mountains between the towns. Occasionally Saito would point out his idea of a perfect location in Japan--an isolated farmhouse surrounded by rice paddies--no TVI and plenty of room for antennas and Beverages (since the rice paddies are dry during the winter).

Finally we reached the house of Toshi, JH1BIN, in Mito. Toshi lives right in the middle of a crowded residential area and it was amazing to see his 2 element 75 meter beam perched like a large Condor over the neighborhood. As I was walking down the street to get far enough away to take a picture of the antenna, another car turned in the driveway. It was Koh, JA1GTF, and Hiro, JF1NZW--two of the biggest Top Band signals out of Japan!

Collection of Top Banders: (L to R) WØZV, JA1XAF (ex EL2FY), JF1NZW, JA1GTF, JH1BIN.

We went to Toshi's backyard and took a photo of some of the Top Banders in front of the tower he shunt feeds on 160.

We all went inside Toshi's house and I gathered some information on 160 operation in Japan from Koh and Hiro while we all shared some cold drinks. They told me that the JARL is promoting adding the 1810-1825 kHz segment to the current allocation of 1907.5-1912.5 kHz. Although this may make it easier to work some countries transceive, the DXers are concerned that the new frequencies will become congested with local ragchews--sounds familiar doesn't it! Fortunately, only CW is allowed in Japan and that is not likely to change.

In Japan, they still have some coastal Loran B stations so the frequencies above 1835 are essentially useless. The Loran tapers off above 1870 and below 1835 with all frequencies below 1825 essentially clear. The JA's don't normally listen above 1815 for USA stations in contests, however. They do listen above 1815 for the Caribbean which is very rare in Japan, so for those of you who plan contest expeditions, please remember this when looking for JA's at your sunrise. From a Great Circle standpoint, JA's working the Caribbean is like working the Middle East from Colorado or working India from the East Coast.

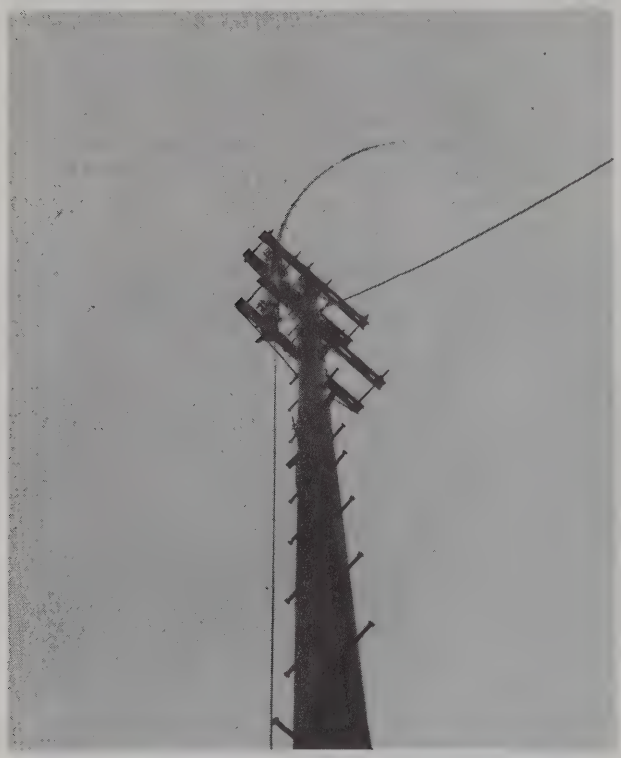
JA1GIF QTH with the 160 m vertical in the "down periscope" position.

New England and VE1-3 is also very difficult and normally occurs only occasionally in January around East Coast sunrise (1200Z or so). Those of you in New England that are trying to work Japan please remember that this is equivalent to some of us Westerners trying to work RF6QAI or UG6GAW on a

once per year opening. A good rule for all of us to follow is: "If you have it confirmed and someone else is calling, stand by and give stations with more difficult propagation paths a chance."

After our discussion, we all headed for lunch at a local restaurant and had "Japanese spaghetti" for lunch. Then we got back in the cars and headed for the location of JA1GTF. Koh is the top DXer in Japan with about 150 DXCC countries worked and 137 confirmed. He is an engineer for Nippon Telephone and Telegraph and is 51 years old. Koh was first licensed in 1960 and has been active on Top Band since 1972. Since he had earlier told me he had a full size quarter wavelength vertical, I was somewhat surprised when we drove to his house in a very crowded residential neighborhood. I saw a 20 meter high pole but where was the vertical?

Then Koh showed me one of the most ingenious setups for 160 I've ever seen!



Close up of JA1GTF's unique telescoping vertical for 160 m in the "up periscope" position.

At the top of the pole there was a standoff which held an insulated sleeve. Koh had a pulley arrangement which allowed him to raise an aluminum tubing whip through the sleeve to the full quarter wavelength height. At the bottom end of the whip a flexible wire was attached which came down to the feedpoint at ground level. Since Koh was surrounded by other houses on 3 sides, I wondered about the ground system. He explained hat he had buried about 20 radials many years ago before the other houses were built.

I paced off the size of Koh's lot and it measured 13 by 15 meters or about 45 by 54 feet! For those of you who think 40 acres is required for 160, here's proof that a lot can be done on a small lot if you're determined (and if you're not, you won't last long on 160 anyway)!

Koh, JA1GTF, Ichiban 160 DXer in Japan!

For receiving, Koh uses the transmit antenna and also a small loop (2.5 meters circumference) mounted on the roof with a small rotator. His rig is an R4C with 250 Hz filter (but no Sherwood 1st IF) and a 20 dB preamp for the loop. During contests, he sometimes is able to put up some short Beverages but I still don't quite understand how he does this (lots of kind neighbors I assume). For transmit, he uses an FT-101Z with 500 watts output from a pair of homebrew 3-500Z's. Incidentally, this is the maximum power output for the highest license class in Japan.

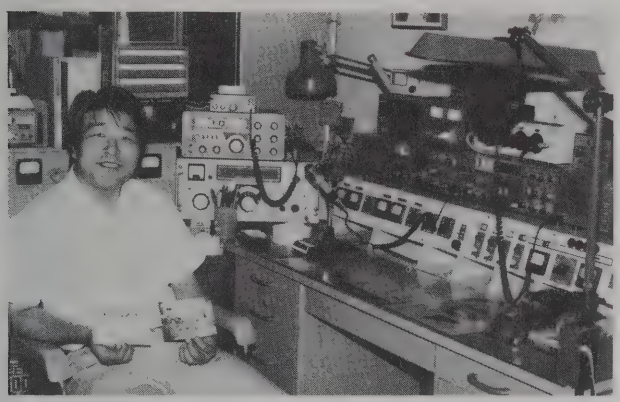
Koh has 36 states confirmed including two contacts with the 1st district--KF1C in Vermont and W1FC in Massachusetts. He also worked VE2FYR this past January but has never heard VE1ZZ (either short or long path). He made a contact with PY1BVY/PY0T in February 85 which he thought might have been long path but wasn't sure.

I took a quick glance at Koh's QSL collection and it was enough to make me and the other JA's drool! BY4AA, BY5RA, VS5RP, 8Q7BC, DU1GF, JT0APE, XX9UT, VK9XB and VU2WTR especially caught my eye as well as almost all the Russian countries and many Europeans. Koh has worked quite a few Caribbean and South American stations which are very difficult from Japan. But time was running short so we all took off to see JF1NZW's station.

Hiro is 30 years old and is an operator at a coastal marine station. He was first licensed in 1973 and has gotten very interested in 160 the past 2 or 3 years. He has been using an inverted L (15m vertical and 18m horizontal) fed at a point 18m above ground with a counterpoise of 13 radials sloping down to ground level. When I was at his house, he had taken down the inverted L and was in the process of constructing the foundation for a full size vertical which will be up this Fall. Hiro already has one of the better signals from Japan so it will be interesting to see how much difference it makes this Fall.

I was really interested to see Hiro's QTH since I knew he was one of the few JA's with a Beverage for 160 (JA1CGM and JA5DQH are the only others I know of). Hiro's house is located on the East edge of a small canyon with a swamp in the middle of it.

He has a 170m Beverage running out through the underbrush 1 to 2 meters high and it is pointed Northeast toward the USA/Caribbean. He could also probably run one to the Southeast although it's apparently not necessary to work the Pacific from Japan. The Beverage is terminated through a resistor to a ground rod at the far end. At the near end, Hiro just feeds the Beverage wire to the coax center conductor and uses the shack ground at the input of an Ameco preamp (sounds very similar to K5UR's setup). Hiro had some excellent recordings of US signals and I even had a chance to hear what a certain weak WØ sounds like in Japan. Hiro also played a tape which Jeff K1ZM had sent when they made contact. Hiro had a good signal in New York but was apparently having some problems hearing Jeff. He explained that he did not have the Beverage up then and that he felt it had made a big improvement in his receive capability. At least its comforting to know that K1ZM is only mortal like the rest of us!



Hiro, JF1NZW, looking to work everyone this season.

Hiro's station is a TS-930S and a pair of 3-500Z's. Although he only currently has 60 countries worked and 53 confirmed, he seems to be extremely enthusiastic and I am sure you all will hear a lot from him next season. Hiro has 30 states worked but, so far, no one from the 1st call area. I'm sure that will change this year--which one of you 1's will be the first?

Hiro is particularly interested in trying to work the Caribbean so I may be asking some of you to try skeds with him if you go to the Caribbean for contests. He is very dedicated and I heard him almost every day I listened this past season. I should probably add that he and JR1EBE are Japan's equivalent of AA1K and K1ZM--they apparently never sleep!

Time was running short so we all piled into the cars again and headed for the train station. A real sense of sadness came over me as I realized I probably would not see most of these fellows again. Although we had some language barriers, there was a real sense of kinship with fellow hams who shared the trials and tribulations of Top Band DXing. Too bad more people in this world don't share our hobby because I'm sure the world would be a much friendlier and happier place if we all knew each other as friends.

Domo arigato to my friend Saito JA1XAF and all the other JA's for a fantastic weekend and I'll continue in Part II with the next stop--Hong Kong and VS6DO.

Sayonara Nihon! (WØZV)

OPERATING THE SMALL STATION

Paula Franke, WB9TBU
P.O. Box 873, Beecher, IL 60401

This month's topic is a bit different from what we usually cover: Novices. But, Novices are also "small stations" and, as such, they are also considered to be a special operating situation. Propagation being what it has been for the last few years, Novices have found themselves limited to basically two bands: 80 m and 40 m. Each of these bands has its own inherent problems, 80 being usable, for the most part, only in the evening. 40 meters? Well, anyone who has spent any time at all in the 40 m Novice band doesn't need any description of what THAT mess is like! (In my mind, the 40 m Novice band is the greatest incentive to upgrade that I have ever seen!) It can probably generally be agreed that Novice operation can be rough and not a little overwhelming at times. Could the Novice experience be any more difficult than it already is?

This month I'd like to introduce another guest columnist, Tom Root, WB8UUJ from Flushing, Michigan. Tom is editor of the Michigan QRP club's newsletter "The Five Watter". His article deals with a subject which most people might, at first thought, believe to be a contradiction in terms: the Novice QRPer.

THE NOVICE AS QRPer

Just one of the several engaging aspects of our interest in low-power amateur radio communications is that there are so very many "rules" to be broken! We pull that elusive DX station out of the pile-up before the QRO/KW can tag him, we work DXCC with one watt and we work WAS with 50 milliwatts. With almost everything we do, we do it with that special flare, we do it QRP. QRP operation is generally accepted to mean transmitting with an output power of 5 watts or less (10 watts PEP).

One long-established "rule" of amateur radio is that the Novice should avoid QRP. After all, isn't getting started in amateur radio difficult enough without adding the greatest handicap of all, low power? Remember the lobby to increase the Novice power limit from 75 watts? 75 watts wasn't enough, it left the Novice at a "distinct disadvantage." 75 watts! Distinct disadvantage!

Well, let me tell you about Mike Whipple (KA8WFL) of Traverse City, Michigan. For those readers familiar with the area, he lives on the side of a gentle slope near the foot of East Bay. Mike didn't really have a choice of rigs so when he was licensed as a Novice on April 21, 1985, he broke one of the "rules" and went QRP. Mike found that if he wanted to get on- the-air, and he did, the only rig available was going to be a modified Heathkit HW-8. That is, it was modified in all respects except the important one, it still had no RIT. RIT is <R>eceiver <I>ncremental <T>uning and is that important circuit in a transceiver which allows the operator to vary the receive frequency without altering the transmit frequency. Anyway, the HW-8 that Mike used did not have RIT. What it did have was a collection of other modifications such as the 15 m increased sensitivity modification and a switchable pilot light (both from CQ, August 1977). The standard main tuning knob had been replaced with the polished and knurled dark green one from the Heathkit HW-32A (part #462-210,

skirt removed). Its other changes included a diode and fuse to protect against crossed power supply polarity and the relative S-meter circuit from Hints and Kinks (QST, November 1979). It also featured a built-in 100 kHz crystal calibrator and a piston trimmer replacement (K8JRO style) for C-302B to aid with the HW-8's inherent calibration difficulties. Mike's HW-8 had a suitably small speaker installed in the top which served as the only audio transducer he used for those first few months on-the-air until he acquired a set of headphones. His primary "Elmer" was Brennan (Bay) Baybeck, KA8SOF, also of Traverse City, Michigan. The two of them, both Novices, went to work to get Mike on the air. Mike's antenna was an 80 m dipole of #14 copper wire from Radio Shack that was tied to porcelain insulators. It was cut for 3725 kHz, fed with RG58/U and then slung by rope between two tall maple trees across the top of Mike's house. It was hung as high as Mike and Bay could get it. The HW-8 was powered with a Gel-cell and the VSWR level was monitored with a borrowed home-brew QRP bridge. The key was stock from Radio Shack. This grand station produced an output of about 3 watts vs. the Novice limit of 200 watts PEP.

Aside from local QSOs with his Elmer, Bay, Mike's "first QSO" occurred at 2356 UTC on June 28, 1985. He answered a CQ from Russell (KAØULO) in Cedar Rapids, Iowa. KAØULO came right back with and RST report of 589 and amateur radio station KA8WFL was officially on-the-air. What a fantastic way to end a day that had been spent cutting and stringing and hanging an antenna.

During Mike's 8 months as an operating Novice he tagged about 50 QSOs with his QRP station and he has QSL cards from about 35 of them. 12 states were logged. All of this operation was on 80 m because that was the band for which his antenna had been cut. Actually, it worked out quite well, 80 m is at its best at night and that's when Mike was able to do most of his operating. He usually used "/QRP" after his call because he felt that this might encourage another station to respond. From a technical standpoint, Mike's Novice career ended on February 8, 1986 when he passed his Technician exam. Overall, he feels that his Novice/QRP experience was a good one because it helped him by forcing him to listen better. He thinks that it helped to teach him better operating skills than if he had been operating near the Novice power limit. Nevertheless, it was frequently frustrating with the very common QRP problem of not being heard.

Mike is a good friend of my son, Amos, and he was 15 years old when these experiences occurred. Admittedly, a "good" Novice career is a matter of definition. What may be very satisfying and rewarding to one may be considered as a disastrous failure to another. Mike was satisfied with his Novice career and certainly did consider himself a QRPer in every sense of the word. He tells me that QRP will remain a part of amateur radio for him in the future.

Novices and other hams can learn about QRP by reading, just as you are doing this very minute. The "bible" of QRP is <The Joy of QRP: Strategy for Success> written by Adrian Weiss (WØRSP) and is available from Milliwatt Books, 833 Duke Street #83, Vermilion, SD 57069. The "bible" of QRP construction is rapidly becoming Doug DeMaw's (W1FB/8) <QRP Notebook> which is available from the ARRL, 255 Main St., Newington, CT 06111. QRP construction activity and the Novice learning experience are ideally paired. Many QRP circuits are simply described and simply constructed. They can serve well as the hands-on projects that convey to the new amateur that "spirit" of what amateur radio is all about. The beginner may not even be able to fantasize the construction of one of those 5 band, all-mode transceivers but might very well find a deep sense of achievement in successfully putting on-the-air a 1 transistor 1/2 watt rig that was self-constructed.

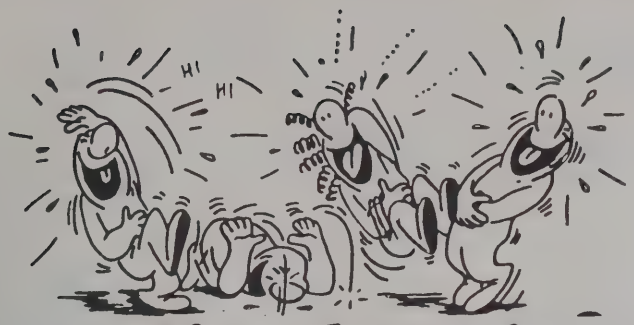
QRP clubs worldwide provide a variety of bulletins that journal the increasing interest in QRP and let you know what hams, like you, are doing with QRP and how they are doing it. The Michigan QRP Club produces <The Five Watter> and can be addressed to 5346 W. Frances Rd., Clio, MI 48420. QRP-ARCI (Amateur Radio Club International) publishes the <Quarterly>. Its address is 10923 Carters Oak Way, Burke, VA 22015. <SPRAT> is a publication of the G-QRP Club in the United Kingdom and can be contacted by writing to Alan Lake (G4DVW), 7 Middleton Close, Nuthall, Nottingham, NG16 1BX. Also, amateur radio monthly magazines such as this one and <QST>, <CQ>, and <WorldRadio> frequently carry QRP related articles and columns. The volume of QRP writing increases monthly. QRP is for all amateurs and the properly prepared Novice is certainly one of them. (WB8UUJ)

(Tom Root, WB8UUJ, as a member of the Michigan QRP Club, can usually be found, along with other MQRPers, on the MQRP Net on 3535Mhz on Tuesday nights at 9:00 EST. Non-members are cordially invited to QNI.)

In this troubled time of trying all sorts of things to interest young people in giving amateur radio a try, one might think that QRP operation would be a sure fire 'kiss of death' to the new Novice. Yes, QRP can be terribly frustrating to anyone, but the whole novice experience can be frustrating in itself. Looking back through my own career in amateur radio, I received my Novice license in August 1976. I did not get my own station until a year later and my first QSO took place a nerve-wracking month and a half after that, but only after day after day of pounding a straight key. What it takes is someone standing in the wings, always encouraging you not to give up. As Tom describes in his article, Mike Whipple was very fortunate to have an Elmer to help him through the initial problems of becoming a ham. I wasn't so fortunate to have an Elmer, but I guess I'm just stubborn. I knew I'd have a great time once I figured out what was going on. Ten years later, I'm still learning "what's going on", but I was right about having a great time. Should a Novice try QRP? I agree with Tom, it's a rule made to be broken. But it sure is nice to have help along the way.

On the subject of Novices, at your next club meeting,why not take time out from socializing with your "old friends" and seek out that new ham who is standing off shyly to the side. Too many times, those shy newcomers get left behind. Make the newcomer welcome at the meetings. Find a place for him or her on a committee--put them to work! Offer to drop in on their shack, let them in on the tricks of the trade. Not every new ham gets into the hobby because a friend or relative is already one. Many have read an article or just heard about amateur radio. They take a class or study on their own and one day find themselves with a ticket in their hands and no idea or what to do next. Swelling the ranks of amateur radio takes more than just conducting classes and giving exams. It requires some follow-up, a kind of amateur radio 'welcome wagon'.

I want to thank Tom for sharing his thoughts and extend an invitation to others to "share my space". So, until next month, 73, Paula, WB9TBU



radio funnies

Mike Crabtree, ABØX

LEARNING CW: 'IT"S ALL IN YOUR GENES!

A BOOK REVIEW BY ABØX

Have you ever wondered why some people who become interested in amateur radio learn CW very easily while others struggle and stumble their way to a license? Our own KCDXC member NØLID, Harvey Sagginbottom, has written a book called, Learning CW: It's all in Your Genes. It presents a thesis that is new an intriguing. Harvey says that a person's genetic background is the key to their success at learning code. But the important part of the thesis is that a person's ability to learn code is directly proportional to their innate musical ability or talent.

Harvey cites research for this thesis from work he did at M.I.T. (Mexican Institute of Technology) while studying for his doctorate. He reports that extensive psychological testing was done on people of the same approximate intellectual capabilities (IQ) and in 94% of the cases, people with musical ability learned at a faster rate and retained more code than non-musical people. NØLID postulates that the rhythm, tone, and nature of high-speed CW is much like an allegro piece of music.

So, it comes down to what you have in your genes. Hard work can make the poor CW op better just like practicing your flute or sax, but only as far as your natural musical ability will allow.

It's practically impossible to evaluate the validity of the research without examining the personality profiles of the people tested and their propensity to return to intrapsychic behavior. So, no official judgement will be made here on the thesis.

Yet, after careful reflection on the thesis, it's hard to dismiss the basic concept. That intangible trait that makes some people good CW ops is still up for debate, but there appears to be something to the thesis!

A brief survey of some KCDXC members indicates some startling facts about some members' lives. A look at these well-known high-quality CW ops may help confirm the thesis:

KØVBU - Bill, is an experienced flute player and can bring up the auto-patch with his flute when he is in the mood.

KBØG - Tim, a well-known contester, has been an avid viola player for years. He currently performs with the Olathe Symphony Orchestra when not contesting.

WØJLC - John, played the piccolo in his high school marching band and still loves a good Sousa march in double time.

NØSS - Tom, played the bass drum in the Warrensburg State College Band.

WØAR - Lee, has played the banjo since he was a child and once appeared on Ted Mack's Amateur Hour.

KØRWL - KCDXC President, though untrained, is an accomplished whistler an once even auditioned for the Gong Show.

KMØL - Steve, is a talented pianist and plays Chopin as well as he works up a JA pile up.

WAØTKJ - Dean, plays the accordion and often performs at weddings and parties all throughout central Kansas (he does a great Weird Al Yankovic imitation that's a real crowd pleaser).

KØUR - Eric, is a member of the Salina Alpine Bell Ringing group and has appeared on local TV several times.

On the other hand, a look at some non-CW types in the KCDXC lends further support to Harvey's theory. If you have ever heard WBØUXI or KØCS sing, you would be certain that there's some validity on the theory.

Of course, more research needs to be done on the topic, NØLID's thesis certainly seems to be true if you base your conclusion on the circumstantial evidence presented by the experiences of various KCDXC members. So, remember, the next time you have some trouble with CW: the weakness may be in your genes!

(WDØSRI and NØLID are ficticious and unassigned callsigns.) (ABØX)

A reunion of the operators from the 1985 V3A Belize DXpedition during the CQ WW DX CW contest. Photo at KCDXC hospitality suite at Dayton, pictured are: (L. to R.) John, W3UM; Jim, W6OUL; Larry, KØRWL; John, WØJLC. (KØRWL)

Jim Smith, VK9NS and his wife Kirsty, VK9NL proudly display the honorary member plaque awarded by the Kansas City DX Club members. (KØRWL)

IC735 REMOTE CONTROL USING THE C-64

Kevin Balmforth, NC6U

The ICOM IC-735 is a very popular transceiver which combines many "bells and whistles" in a very small package. One of the advertised features is "RS-232 computer control" capability; however, the operating manual contains no information on how to use it. At this writing, ICOM does not even sell a computer interface for the IC-735. After some correspondence, an information package was received from ICOM which contained the same information on the communication protocol and the software commands. It was apparently translated directly from Japanese, and had numerous errors and inconsistencies! After some thought and experimentation, some BASIC software and a hardware interface module was developed for the Commodore 64 computer. This article explains the communication protocol with examples, and presents a prototype interface module.

THE IC-735 COMMUNICATION PROTOCOL

The IC-735 uses a communications protocol that ICOM calls "Carrier-Sense Multiple Access with Collision Detection," or CSMA/CD. This is different from the other protocols used by ICOM for several reasons:

1. Only two wires are required - signal and ground - between the radio and the computer.
2. Data is sent in "packets."
3. Up to 7 different radios and controllers can be wired together on the same serial bus.

Let's examine each of these points in detail.

Serial Data Transmission - The IC-735 sends and receives data serially (one bit at a time) at a rate which is programmable by internal jumper to 300, 1200, or 9600 Baud. A byte (8-bits) of data is transferred as illustrated in Figure 1.

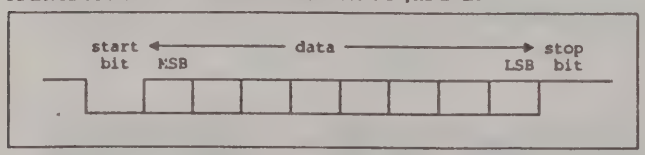


Figure 1. Serial Byte Transfer.

The signal line is held high normally until the byte is sent. The line drops low for a clock sequence, beginning with the MSB. After the last bit is sent, the signal line is again held high until the next byte is sent. Since a transfer is signalled by the start bit, and is always followed by 8 data bits, no handshaking is needed at this level. Therefore, only a signal line and a reference ground line are required.

Packets - In a normal transaction between the radio and the computer, a sequence of data bytes is sent from the one to the other to initiate an command or reply to a command. Each data sequence is called a "packet" and consists of a header, data and a trailer as illustrated in Figure 2.

The header begins with two packet start bytes, followed by two source and destination device address bytes, and the command code byte.

The packet start bytes indicate the beginning of

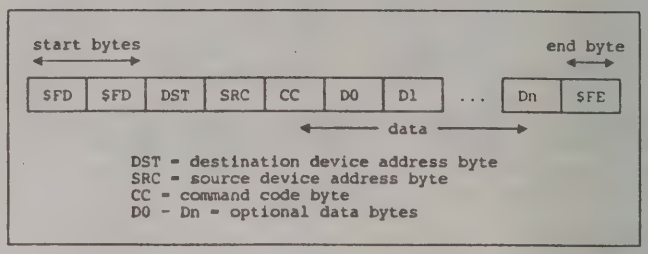


Figure 2. Packet Format.

the packet transfer to the computer or radio, much like the start bits indicate the beginning of a byte transfer to the hardware. The hexadecimal value of each start byte is $FD.

The device address is a byte which uniquely identifies the destination or source of the packet. For example, the IC-735 is jumpered internally at the factory to be device address $04. By removing the cover and changing the jumper wires on connector J22, the radio's address maybe change to any address from $01 to $07. The computer device address could be anything from $01 to $07, except the address belonging to the radio. For the purposes of this article, we will choose the computer to be device address $01. Now when the computer sends the radio a packet, the destination and source device addresses will be $04 and $01, respectively. Likewise, when the radio sends the computer a packet, the destination and source addresses will be reversed. The reason for keeping track of who sends the packet and who receives the packet will be clear in a minute.

The last byte in the header is the command code. This byte indicates the command codes recognized by the IC-735, as illustrated in Figure 3. The codes can be divided into two groups. The first group queries the radio for information, such as the currently

Command Code	Function	Command Data	Reply Data
$00	set frequency	freq	none
	freq: 10Hz 1Hz (←byte→) 100Hz 1Khz (←byte→) 10Khz 100KHz (←byte→) 1MHz 10MHz (←byte→)		
$01	set mode	mode	none
	mode: $00=LSB, $01=USB, $02=AM, $03=CW, $05=FM		
$02	query lower and upper frequency edge	none	$02 freq_l $2D freq_u
$03	query frequency	none	freq
$04	query mode	none	mode
$05	set frequency	freq	$FA/$FB
$06	set mode	mode	$FA/$FB
$07	set VFO	none=VFO mode $00=VFO A $01=VFO B	$FA/$FB
$08	set memory	none=MEM mode $01 to $0C = MEM 1 to MEM 12	$FA/$FB
$09	write displayed frequency/mode to current memory	none	$FA/$FB
$0A	write displayed frequency/mode to current VFO	none	$FA/$FB

Figure 3. Command Codes.

displayed frequency or mode. The second group changes certain parameters in the radio such as frequency, mode, VFO/memory, VFO A/B, and memory channel.

The data part of the packet consists of 0 or more bytes which are the parameters required by the command code. The number of data bytes is dependent on the command code as illustrated in Figure 3.

The packet trailer indicates the end of the packet transfer to the computer or radio. It consists of a single byte with the value $FE.

Multiple Access - One of the interesting features of the CDMA serial bus is that up to 7 different computers and radios can be hooked together using the same signal and ground line. Because each packet has a source and destination device address, only devices with the packet's destination device address will accept the packet; it is ignored by all the others. Ideally, one could control several radios from the same computer, or even control the same radio from several computers.

A valid question is "What happens when two or more packets are sent on the bus at the same time?" Such an event is called a "collision." Each time a packet is sent, the source device compares what it sends with what is on the bus at the same time; a collision is detected if the two are different. When this occurs, the source device immediately stops sending its packet, sends a "jamming chord" instead, and then waits an arbitrary period of time before trying to send the packet again. A jamming chord consists of 5 bytes with the value $FC, sent in succession. The purpose of the jamming chord is to enable the other source(s) to also detect a collision, and eventually clear the bus.

Packet Examples - Now that you know what the packet looks like, how would a typical exchange between the radio and the computer occur? Normally, the computer initiates an exchange with a query or a change command in packet format. The radio then responds with one or more packets, depending on whether the command was a change or query.

For a change command, a single packet is returned which signals "pass" or "fail." The header of the return packet is an "echo" of the previous packet, except that the source and destination device addresses are reversed. A single data byte indicates pass or fail. If the change is accepted by the radio, the data value returned is $FB (how appropriate). If the change is not accepted, or if the command code is not recognized by the radio, the data value returned is $FA.

For a query command, a single packet is returned which contains the requested information, or else signals "fail."

Here is an example of how this works:

To change the radio's mode to USB, the computer sends the packet

$FE $FE $04 $04 $06 $FB $FD

If the radio acknowledges the change, it replies with

$FE $FE $01 $04 $06 $FB $FD

To change the radio's frequency to 14.3 MHz, the computer sends

$FE $FE $04 $01 $05 $00 $00 $30 $14 $FD

To which the radio replies

$FE $FE $01 $04 $05 $FB $FD

Note that the least significant digits of the frequency are sent first; this allows the computer to tune the radio without sending the most significant digits unless required.

For example, if the radio is at 14.30000 MHz, the packet

$FE $FE $04 $01 $05 $10 $FD

changes the frequency to 14.30001 MHz. To query the radio's current mode, the packet

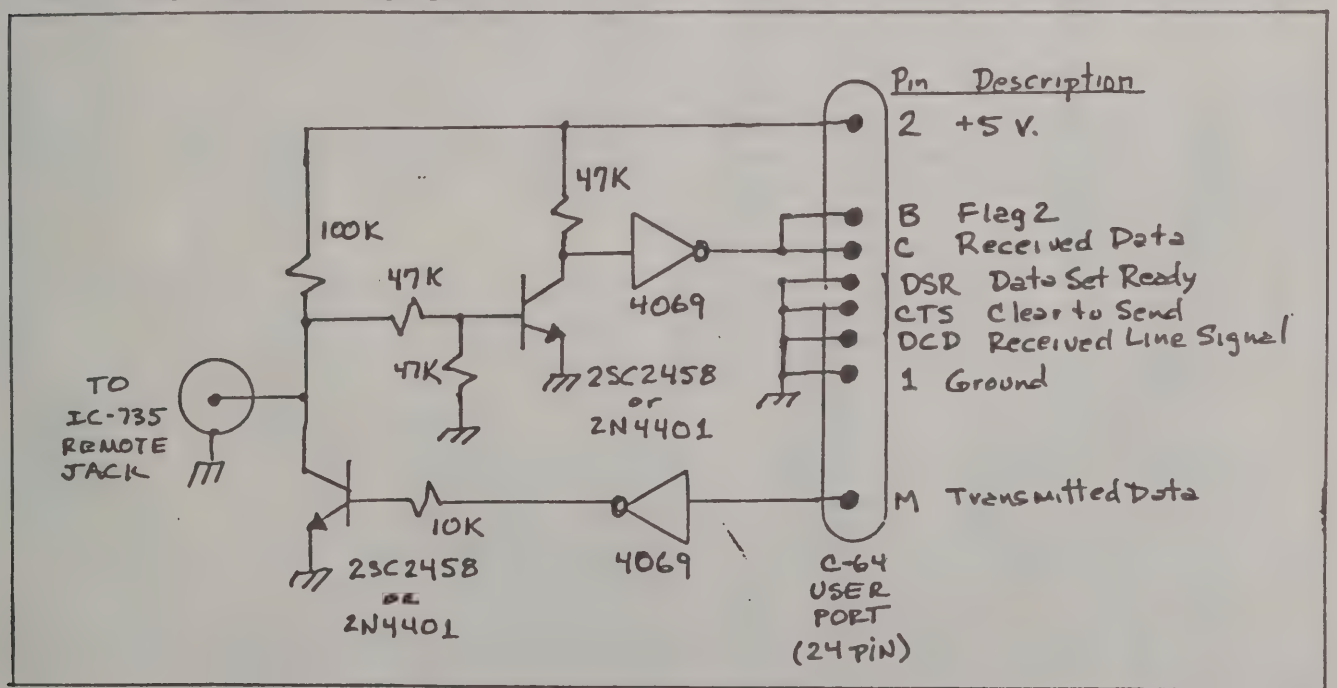


Figure 4. Hardware Interface Circuit between C-64 and IC-735

A simple interface program to control IC-735 by Commodore C-64

```
READY.

10 REM DEMO OF IC735 COMPUTER CONTROL CAPABILITY
11 REM WRITTEN BY KEVIN D. BALMFORTH NC6U
12 REM ALL RIGHTS RESERVED 1986
20 OPEN2,2,3,CHR$(8)+CHR$(0)
30 DIMTB(20):DIMRB(20)
31 TB(1)=254:TB(2)=254:TB(3)=4:TB(4)=1
50 PRINT"{C/DN}{C/DN}{C/DN}    SELECT COMMAND":PRINT""
51 PRINT"QUERY FREQUENCY:  1"
52 PRINT"QUERY MODE:       2"
53 PRINT"SET FREQUENCY:    3"
54 PRINT"SET MODE:         4"
55 PRINT"VFO:              5"
56 PRINT"VFO A:            6"
57 PRINT"VFO B:            7"
58 PRINT"MEMORY:           8"
59 PRINT"MEMORY CHANNEL:   9"
60 PRINT"MEMORY ← VFO:    10"
61 PRINT"VFO ← MEMORY:    11"
62 PRINT""
63 PRINT"EXIT:             0"
64 PRINT"":PRINT""
70 INPUTA:IFA<0ORA>11THENGOTO50
71 IFA=1THENGOSUB100
72 IFA=2THENGOSUB200
73 IFA=3THENGOSUB300
74 IFA=4THENGOSUB400
75 IFA=5THENGOSUB500
76 IFA=6THENGOSUB600
77 IFA=7THENGOSUB700
78 IFA=8THENGOSUB800
79 IFA=9THENGOSUB900
80 IFA=10THENGOSUB1000
81 IFA=11THENGOSUB1100
82 IFA=0THENEND
83 GOTO50
100 REM *** QUERY FREQUENCY ***
101 TB(5)=3:TB(6)=253:NT=6:QF=1:GOSUB2000
110 F$="":FORI=9TO6STEP-1:F$=F$+CHR$(RB(I)/16+48)+CHR$
120 PRINT"":PRINT"FREQUENCY IS ";F$:PRINT"":RETURN
200 REM *** QUERY MODE      ***
201 TB(5)=4:TB(6)=253:NT=6:QF=1:GOSUB2000
202 F$=""
210 IFRB(6)=0THENF$="LSB"
211 IFRB(6)=1THENF$="USB"
212 IFRB(6)=2THENF$="AM"
213 IFRB(6)=3THENF$="CW"
215 IFRB(6)=5THENF$="FM"
220 PRINT"":PRINT"MODE IS ";F$:PRINT"":RETURN
300 REM *** SET FREQUENCY ***
301 PRINT"ENTER FREQUENCY: ";
310 F$="":TB(5)=5:FORI=9TO6STEP-1
320 GETC$:IFC$=""THENGOTO320
321 PRINTC$;
330 GETD$:IFD$=""THENGOTO330
331 PRINTD$;
340 TB(I)=((ASC(C$+CHR$(0))-48)*16)+(ASC(D$+CHR$(0))-48):NEXTI
350 QF=0:TB(10)=253:NT=10:GOSUB2000:RETURN
400 REM *** SET MODE ***
401 PRINT"ENTER MODE: ";
410 GETC$:IFC$=""THENGOTO410
420 PRINT"":TB(5)=6
430 IFC$="L"THENTB(6)=0:GOTO440
431 IFC$="U"THENTB(6)=1:GOTO440
432 IFC$="A"THENTB(6)=2:GOTO440
433 IFC$="C"THENTB(6)=3:GOTO440
434 IFC$="F"THENTB(6)=5:GOTO440
435 RETURN
440 TB(7)=253:NT=7:QF=0:GOSUB2000:RETURN
500 REM *** VFO ***
501 TB(5)=7:TB(6)=253:NT=6:QF=0:GOSUB2000:RETURN
600 REM *** VFO A ***
601 TB(5)=7:TB(6)=0:TB(7)=253:NT=7:QF=0:GOSUB2000:RETURN
700 REM *** VFO B ***
701 TB(5)=7:TB(6)=1:TB(7)=253:NT=7:QF=0:GOSUB2000:RETURN
800 REM *** MEM ***
801 TB(5)=8:TB(6)=253:NT=6:QF=0:GOSUB2000:RETURN
900 REM *** MEM CHANNEL ***
901 INPUT"CHANNEL";CH
902 IFCH<1ORCH>12THENGOTO901
903 CH=(INT(CH/10)*16)+(CH-INT(CH/10)*10)
910 TB(5)=8:TB(6)=CH:TB(7)=253:NT=7:QF=0:GOSUB2000:RETURN
1000 REM *** MEMORY ← VFO ***
1001 TB(5)=9:TB(6)=253:NT=6:QF=0:GOSUB2000:RETURN
1100 REM *** VFO ← MEMORY ***
1101 TB(5)=10:TB(6)=253:NT=6:QF=0:GOSUB2000:RETURN
2000 GET#2,C$:SS=ST:IF(SSAND8)<>8THEN2000
2010 FORI=1TONT:PRINT#2,CHR$(TB(I));:NEXTI
2011 FORI=1TONT:GET#2,C$:NEXTI
2012 IFQF<>1THENRETURN
2020 I=1:FORJ=1TO100
2030 GET#2,C$
2040 RB(I)=ASC(C$+CHR$(0)):IFRB(I)=253THENRETURN
2050 I=I+1:GOTO2030

READY.
```

$FE $FE $04 $01 $04 $FD

causes the radio to reply

$FE $FE $01 $04 $04 $01 $FD

which is USB.

Another type of exchange is initiated by the radio if the internal "transceive" jumper J22 is enabled (which is the way it comes from the factory), and the front panel display frequency or mode is manually changed. When this occurs, the radio sends an update packet to the last device it talked to. For example, if the radio is manually tuned from 14.300 MHz to 14.310 MHz, a series of packet will be sent to the computer indicating the current frequency. The number of packet depends on the tuning rate: slow tuning causes more packet to be sent, etc. This mode of operation has some interesting possibilities. Suppose that two IC-735 radios are connected together such that one radio has the transceive jumper disabled, and has a different device address than the other. Then the radio with the transceive jumper enabled can control the frequency, mode and etc. of the other radio!

Using the Commodore 64 as a Controller - To become familiar with the communications protocol of the IC-735, I wrote a simple interface program in BASIC. The program is listed at the end of this article. The BASIC program makes use of the TTL-level "RS-232" hardware built into the Commodore 64 and the hardware interface circuit described in the next section; other computers would either require add-on TTL-level RS-232 boards, or assembly -level software to perform the same functions. To use it, simply run the program and follow the prompts.

I also wrote more sophisticated controller program which draws a screen displaying the time, the current VFO frequency and mode, the memory channel number (1 to 15), and the memory frequency and mode. An on-screen menu prompts the user to interactively change mode, tune the VFO at different rates, directly select the frequency or the memory channel, set the time, transfer between memory channels and the VFO, and transfer all the modifiable parameters between the computer and a disk file. The entire program is too long to list here; I will furnish a listing for $5.00 plus a business size SASE, or a listing plus a diskette for $10.00 plus a large manilla SASE. (621 N.Ladera Vista, Fullerton, CA 92631)

HARDWARE INTERFACE

The hardware interface between the Commodore 64 and the 2-wire bus is simply a mirror image of the circuit used by ICOM between the microprocessor in the IC-735 and 2-wire bus (Figure 4). Simple!

A 24-pin socket for the user port was mated to a small perforated circuit board on which the circuit was built. A 3 foot length of RG-172 was used to connect the interface and the radio. The total cost of the components was $2.50.

CONCLUSION

The purpose of this article was to disseminate some information on computer control of the IC-735. I hope that it will stimulate additional interest in remote control of HF radios. In these times of antenna restrictions, such a scheme might allow a group of hams to use a "dream station" from the comfort of their own homes. I wonder if W7RM would mind...? (NC6U)

Vertical Antennas for the Low Bands Part II

John Kaufmann, W1FV

Part I of this series discussed the design and operation of single-element vertical antennas for use on the low bands (80 and 160 meters). In Part II, we tackle the problem of designing phased-vertical arrays, showing why it is usually done incorrectly and what it takes to do it right.

Why Phased-Vertical Arrays?

Phased-vertical arrays have the same desirable operational characteristics as single-element verticals in DX work, with the obvious additional advantages of gain and directivity. A properly designed array is capable of providing deep nulls in the radiation pattern. When my 80-meter array s switched on Europe, stateside interference off the back of the array drops by as much as 20 to 30 dB. Furthermore, there is a significant reduction in pickup of atmospheric and man-made noise by virtue of this same directivity. With the flip of a switch, I often find a stateside rag-chew can be replaced by a DX station on the same frequency. The instantaneous direction-switching capability is also an asset to the contester.

From a practical viewpoint, the construction and maintenance of vertical antennas can be considerably easier than for some of the monster antennas used on the bands today.

However, proper design of phased-vertical arrays is not as simple as is commonly believed and here we will discuss why.

Design Overview

The principles of phased-array operation are straightforward. Using a two-element vertical array as a design example here, the object is to drive each element with currents of the proper relative amplitude and phase to achieve the desired directivity and/or gain. If the currents in each element are of equal amplitude and are in phase, then broadside bi-directional operation is obtained. On the other hand, uni-directional end-fire operation results by altering the phase in one element so as to cancel radiation in one direction.

The amount of gain depends upon the element spacing and the phase difference of the currents in each element. Maximum forward gain does not usually coincide with maximum front-to-back. However, phased-arrays are usually designed for the best front-to-back because enhancement in receiving capability usually outweighs the small additional gain obtained in a maximum-gain design. The largest gain for a two-element system – over 5 dB – occurs in end-fire oper-

ation with very close element spacing, but the drive-point impedances are very low, making the actual array performance very dependent upon loss resistance (particularly ground loss) in the system.

The objective in a phased-array design is to deliver currents of the correct amplitude and phase to each element, and to minimize system losses, principally ground loss. For most of the commonly used array configurations, the currents in each element should have equal amplitudes, although there are some exceptions in systems with larger numbers of elements.

Mutual Coupling

The design problem becomes complicated by the well known phenomenon of mutual coupling between elements in an array. Briefly, the amplitude and phase of the current flowing in one element is affected by the currents flowing in other elements of the array. Changing the parameters of the current in one element causes the amplitudes and phases of currents in all the other elements to also be altered. As a result, the drive-point impedance of each element will not only be different than its natural self-resonance (nominally 36 ohms or so for quarter-wave verticals with zero loss resistance), but will depend specifically on what currents are flowing in the other elements. Generally speaking, mutual coupling increases as the element-to-element spacing is decreased.

The following effects can occur: (1) The impedance of each element can differ substantially from its self-impedance. In my 80-meter array, which uses eighth-wave element spacing, impedances under 10 ohms occur in phased operation, along with significant amounts of capacitive or inductive reactance. (2) The impedances can differ from element to element. This is a natural consequence of mutual coupling – the differing current phases between elements causes the effects of mutual coupling to differ in terms of the drive-point impedances resulting at each element. (3) Close-spaced arrays are attractive because of their physically compact dimensions and, as indicated above, their high theoretical gain. However, in practice, strong mutual coupling makes them very sensitive to mistuning and other effects.

The theory of mutual coupling and how to design phased arrays in the presence of this effect were worked out in the 1930's for application in the AM broadcast industry. Basically, proper design procedure calls for calculating the impedances of each element, taking the mutual coupling into account in the desired configuration, and designing an electrical network to drive currents of the proper amplitudes and phases into these impedances. Further discussions on this subject follows below.

Why Conventional Phasing Lines Don't Work

It has been common practice in amateur phased-array design to employ phasing lines, usually made of coaxial cable. However, these lines almost never produce the desired current phases or amplitudes, and the reason is mutual coupling.

As a result, with incorrect drive conditions, there is a degradation in both the forward gain and the front-to-back performance of an array. It is hard to generalize on how much loss results because the effects can vary widely, depending upon the particular parameters of a given installation. Usually the front-to-back is more sensitive to current-drive errors than forward gain.

The key fact, usually overlooked in many designs, is that a transmission line must be terminated in an impedance equal to its characteristic impedance in order to produce a phase shift at the load which corresponds to the electrical length of the line. There are some exceptions to this rule – for example, a half-wave line always produces a 180-degree phase shift, regardless of termination impedance, and there are some other instances which do not usually occur in practice. Therefore, a 50-ohm coaxial delay line should be terminated in a 50-ohm antenna to produce the desired phasing. At this point it is tempting to think that the solution is to first individually match each element of the array to 50 ohms and then connect the phasing lines. However, the proceeding discussion on mutual coupling shows why this won't work: a single element which is matched to 50 ohms while the other elements are not driven will almost certainly not look like 50 ohms when the elements are driven in array operation.

A Design Solution

As we discussed, the theory of phased-array antennas was developed years ago. The only problem is that because the theory is rather mathematical, it has not found its way into the amateur literature until recently. In 1983-1984, *Ham Radio* magazine ran a series of articles by K2BT on phased-vertical arrays (Ref. 1). In my opinion, these articles provide the most accurate and comprehensive treatment of the subject available in any amateur journal or handbook. Some recent work by W7EL (Ref. 2) also treats the subject, but does not appear to be widely available. The K2BT series should be required reading for any amateur attempting to design and construct a vertical phased array. It is rather technical but does provide a complete procedure for designing an array. My 80-meter array was designed in accordance with the principles given in the articles and it worked the first time it was fired up. A complete discussion of the material is beyond the scope of this article, but I will try to summarize the main results here.

First an array configuration (number of elements, the overall geometry, etc.) must be selected. Guidelines for this selection can be found in the articles. Then a series of impedance measurements are made on each vertical in the array. The results are used to calculate the mutual coupling and, in turn, the actual drive-point impedances which will result in phased operation. Knowing the element impedances, a phasing network which uses L-C (inductor and capacitor) elements can be designed to drive the elements with the correct currents. Unfortunately, the impedance measurements require the use of a laboratory-grade impedance bridge, which is an instrument not usually available to the average amateur. Commonly used inexpensive noise bridges do not have the required accuracy in most situations. Also, the mutual coupling and L-C network calculations can involve a lot of tedious math, which is best left to a computer.

The topology of the resulting system (using a 2-element array as an example) is shown in Figure 1. Note that the elements are all fed through equal-length coaxial lines. No phasing lines are used since the phasing is achieved in the L-C networks. These networks are comprised of simple L and pi (or T) type networks which accomplish the following functions: (1) the impedances at the inputs of each coax feeder are transformed by the L networks to a value which insures that the antenna currents divide in the correct ratio for each element, (2) the pi (or T) networks provide the phase correction to achieve the proper relative current phasing in the elements, and (3) these same networks also provide a 50-ohm match to the transmitter end of the system.

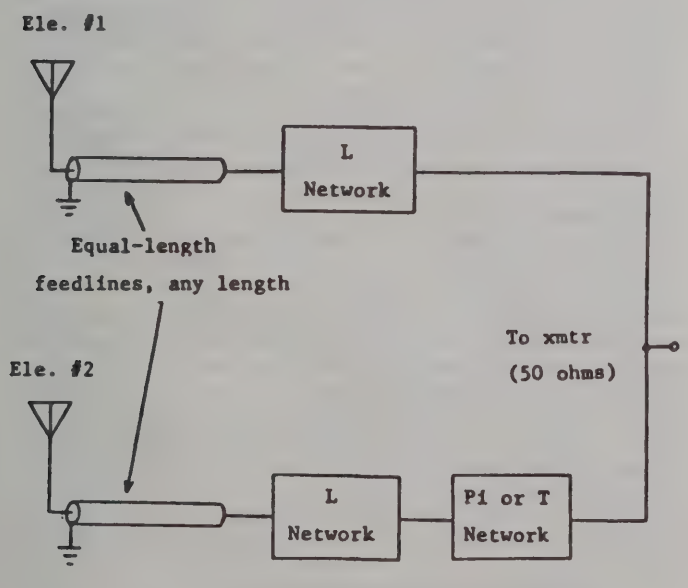


Fig. 1 Two-Element Phased Array Design

For those who do not want to get involved in extensive measurements and calculations, K2BT has provided a number of complete designs of 2, 3, and 4 element phased-vertical arrays in the articles. These designs are based on textbook theory and in practice, real antennas in non-ideal environments may not confirm exactly to the theoretical results. Nonetheless, using one of these design examples may be a good starting point for building a working system, provided one is careful about the construction and is willing to do some fine-tuning of the final product to optimize performance.

Radial Systems for Phased-Vertical Arrays

Part I of this series discussed the importance of a low-loss ground radial system for vertical antennas. Efficient antenna operation will result only when enough radials have been installed to drive the ground-loss resistance to a value which is much smaller than the radiation resistances of the individual elements. These same principles apply to phased-vertical arrays. However, as indicated above, the effects of mutual coupling in a phased array can cause the impedances to differ substantially from that of a single vertical. Hypothetically, if the radiation resistances of each array element in phased-array operation are around 10 ohms (as they are in my system) and 10 ohms of ground loss exists at each element, the overall system radiation efficiency (calculated from the expression given in Part I of this series) is only 50%. An effective gain reduction of 3 dB results for this array. On the other hand, a 10-ohm ground loss with a single-element vertical (which has a 36-ohm radiation resistance) results in nearly 80% efficiency. These numbers point to the important conclusion that low-loss radial systems can be more vital to efficient operation of phased arrays (particularly close-spaced arrays) than for single-element systems. That is why I do not consider the use of over 100 radials per element in my close-spaced array to be overkill.

Finally, since a radial system is required under each element of an array, the question arises as to what to do with the radials where they overlap each other. Figure 2 gives the answer for the 2-element example. A bus wire is laid between the elements. The radial wires from the adjoining systems are not allowed to overlap, but are electrically fastened to the bus wire.

In conclusion, it should be apparent that properly designing a vertical phased-array can be more complicated than is usually realized because of widespread misconceptions about phased-array design, and, in particular, about use of phasing lines. (Unfortunately, the amateur literature, until recently, has tended to contribute to the misinformation). Because it is impossible to completely cover the subject in this short series of Scuttlebutt articles, serious would-be array designers should consult the references given in the two articles of this series.

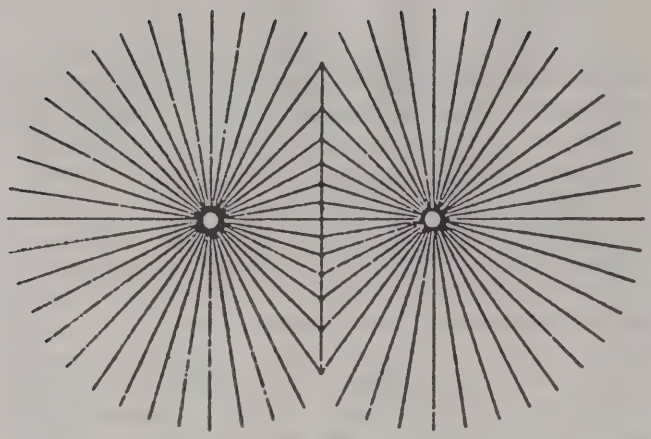


Fig. 2 Radial System for Phased Array

References

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(Reprinted from Yankee Clipper Contest Club-Scuttlebutt Bulletin, K1XM Editor)

HIRED GUNS

Mike Spenuk, VE3JTQ

What's all the controversy over Guest Operators? The way I see it, those that are complaining are simply taking the easy way out--instead of putting more time and effort into their own stations. Actually, I have just reversed what the controversy is all about, haven't I?

Just a few years ago this problem was non-existent. So let's go back in time and see how the controversy evolved. In the beginning there were no "big gun" stations--just guns with big ideas and not too much money. I won't rattle off callsigns or names because they are not important to this discussion; besides, I don't want to leave anyone out.

As the sunspots came and went these guns with big ideas accumulated the foundations (their wives/families called it junk) of today's superstations. But as the sunspots came and went, so too did the years. The guns began to loose the edge necessary to compete with the younger pistols. Eventually the little pistols, who constantly buzzed around the big guns (as they are now known) were invited to operate.

To the big gun and the little pistol operator this was a very acceptable condition. But right from the beginning a problem arose: whose call sign to send into the ether? The most obvious answer came from the big gun, "Use your own callsign. You can fool all the competition!" Well, the little pistol couldn't argue with that logic--until 1986.

Today many of the big guns are gone. Those that remain prefer to keep the station operational, but have no interest in the rigors of competition. The Guest Operator has numerous stations to choose from for the weekend competition.

I don't know about the rest of you, but I think the person that spent thousands of hours building, developing and fine tuning the station should receive credit in the contests, too.

The problem that we have come across is not unique to amateur radio. Look for a moment at auto sports. In stock car racing, things started out pretty simple: one or two guys, a car and a lot of ingenuity. They had fun and even won races from time to time. Then came commercial sponsorship. Some guys were lucky to get the support; others had to make do with what they had. You know who won the races, but that didn't stop the little guys from competing.

The biggest complaints in radio competitions seem to be occurring in Sweepstakes. So what if the Guest Operators are winning this event. It doesn't prevent me from continuing to develop the station and compete and someday win, maybe. Think about what will happen to these Guest Operators when there isn't any stations available for them. They only know how to operate. They know nothing about designing the successful station. As we all know, it isn't as easy as it looks!

As long as the Guest Operator uses the callsign of the station and doesn't bring his own station callsign when he is "Guesting" then I see nothing wrong with Guest Operator operations. There is nothing stopping any of us from either going to a big gun's station for the weekend, or inviting a big gun operator to operate for the weekend.

This brings up the important criterion. I would like to compile the rules from each country regarding whether the station or the person is given the licence, or whether the station is given the license and the operator is given an operator's certificate. Here in Canada, the station has the callsign; operators have a certificate--the callsign license plates actually falsely promote the operator as having the callsign.

If the station has a distinct callsign in a majority of countries than we should allow Guest Operators to compete with the rest of us in the same categories. Operators using other call signs at a given station are operating in contrary to the rules of the radio service in their country and are therefore disqualified from the competition since the contests clearly indicate that the station must be operated under the rules and regulation in the country.

If on the other hand a majority of countries give the license to the individual and not to the station, then Guest Operator operations can not be allowed to compete in the same categories as the rest of us, for obvious reasons.

Well, that's about it for Guest Operators. Actually it is just a few that appear to be ruining it for the rest of the honest operators. In the contest results the station callsign should appear followed in parentheses by the operator's "callsign". This way both the operator and the station owner get equal credit for the accomplishment.

I look forward to your input regarding the rules in your country. Please send them via: Hamrad Research Group, P.O. Box 4545 Station D, Hamilton, Ontario, L8V 4S7 Canada (VE3JTQ)

IF YOU RECEIVED RADIOSPORTING
AND ARE NOT A SUBSCRIBER
IT WAS NO ACCIDENT!
PLEASE CONSIDER IT AN INVITATION TO JOIN

Chuck Clark, K4ZN

TRAFFIC EMERGENCY

ARRL BOARD MEETING

The "Blue Ribbon" committee presented its preliminary report to the Board of Directors at the July meeting. Actions already taken include recommendations that ARRL headquarters develop a written contingency plan, that ARRL should combine all emergency activities (ARES, RACES, Skywarn, etc.) under the ARRL umbrella, and that it should, in conjunction with FEMA, Red Cross, and other agencies, develop an emergency team capability. Further studies are being conducted on emergency communication teams and on large volumes of traffic on NTS.

One might wonder about the plan to provide the all-enclosing umbrella. It may be that some such activities may already have their own umbrellas. RACES, for instance, is under Civil Defense, a government body, is established as such by FCC regulation (Subpart F of Part 97), and so might be better able to provide ARRL with the umbrella rather than vice versa. MARS is under the military umbrella already, in fact is not really Amateur Radio at all, even though any civilians who participate are required to be licensed amateur radio operators. Still, ARRL can certainly give these various groups valuable support, and should do so.

Two committees took up the packet radio question, an ad hoc committee on digital communication and the Emergency Communications Advisory Committee. It was reported that there are currently 18,000 stations using packet at this time and their number is surely bound to increase rapidly. The Board encouraged the design of protocols to accommodate traffic in the standard NTS format. Spread-spectrum communications were also discussed, but the Board felt that taking any action at this time would be premature, because amateurs have not yet had enough experience in this field to develop standards, and so establishing any standards at this time could hamper development.

The Board also went on record as being opposed to any fees to be paid to spectrum managers for coordinating frequencies.

WHITHER PACKET?

In the July-August issue of The Networks, a traffic handlers bulletin published by Jim Hatherley, WA1TBY, Bob Weinstock, KN1K, reports on the status of packet in the New England area. The National Traffic System (NTS) has been operating since 1949, but packet is still in its infancy. They are trying to join forces, however, to combine their strong points to form a system greater than the two of them.

At its meeting in 1984, the Eastern Area NTS Staff decided that a committee should study packet and report on its value and best use. The committee was appointed in the spring of 1985, and the report was made at the staff meeting the following autumn. The committee was then directed to make further studies and deliver another report, which was distributed to the staff members February 1, 1986.

The report described packet as an alternative to the National Traffic System, with the result that two of the members of the committee filed dissenting opinions, to the effect that the committee should have instead discussed how use can be made of packet within NTS.

Bob tells of some weaknesses of packet that should be overcome for it to be more useful as a means of passing NTS traffic. Packet offers the advantages of possible near real-time speed, around-the-clock availability, automatic error correcting.

But it has disadvantages too. A message in NTS can be traced through the system, and every station that handles it gives receipt for it. It's like registered mail. Packet systems, on the other hand, route messages in a more haphazard manner, sometimes achieving outstanding results, sometimes losing traffic entirely. Any operator accessing a bulletin board, for example, can ordinarily read any message posted there and remove it from the board. Bob gives several instances of messages going round and round as amateurs pick them off one board to post on another, with nobody knowing who did it or where the message was taken. It could easily happen that someone finds a message for another amateur on bulletin board A and transfers it to board B. Later the addressee checks board A and doesn't find it, but someone tells the addressee that there is a massage on board B, so the addressee checks there, only to find that someone has moved it elsewhere, with no indication as to where that elsewhere is located. Or maybe there could be a plague of censors who simply eliminate anything they think improper or that they simply don't like.

These are real problems, but packet is new and so such problems are to be expected. They will be solved, and probably they will be solved soon, possibly by some kind of protocol that keeps track of formal traffic, who puts it in or takes it out. And when they are solved and packet is integrated into NTSS, the result will be a much more effective communication system. It is to be hoped that NTS people will see it as a challenge and not as a threat. We have gone from spark to CW to voice in our traffic handling, and it looks like packet may be the next step. As in the earlier progression, it should not do away with the older modes, but rather enhance them. Oh well, CW did do away with spark, but there really was no choice there, the Federal Radio Commission took care of that. And we might still use spark in a life-and-death emergency when it provided the only way to get help. It would be likely to bring help in a big hurry too, if only to get that band-hogging noise off the air!

ASSISTING NATIONAL WEATHER SERVICE

The National Weather Service has two main functions in its day-to-day operation: collecting data on the current weather and using that data to

forecast future weather. It's obvious that a forecast can be no better than the data on which it is based (except by coincidence, and that happens). And so the meteorologists are always interested in anything that can improve their data.

They have thousands of reports from stations throughout the country every day, and try to have enough to obtain reports on any significant weather anywhere. Weather stations cost money, however, and so there's a limit to the number of stations that can be functioning. Another problem is the fact that most of the earth's surface is covered with water, and reports from that area are few and far between, but are just as important as reports from land stations. Ship reports are needed, the more the better, but even if all large merchant vessels were to cooperate only a limited area of the globe would be covered, as shipping tends to concentrate in a few heavily-traveled routes, leaving vast areas of the ocean rarely visited by a ship. In addition, now that few passenger vessels are operating, few ships carry more than one radio operator. To transmit a weather report during the operator's time off watch would entail payment for overtime, and so skippers are reluctant to do so. The National Weather Service is now encouraging smaller vessels to furnish weather reports, suggesting that they be sent by VHF radio to a marina to be forwarded to the NWS.

For many years the National Weather Service, and its predecessor the U.S. Weather Bureau, have recognized the outstanding contribution that Amateur Radio has been able to make in providing additional weather reports. Amateurs not only have the radio equipment, most also have the technical background that makes them easily trained as weather observers, gives additional value to their reports. And so it might seem that the National Weather Service should enlist the services of radio amateurs in providing supplementary weather reports.

Except for one thing, or maybe two, Sections 97.110 and 97.114 (a) (3) prohibit the use of amateur stations for business communications except in emergencies, whether for the business of the operator or licensee, or for that of any third party. And the FCC has ruled that gathering routine weather reports even for the NWS is business communication. When there is a severe weather alert, such as a hurricane or tornado watch or warning, the FCC recognizes that an emergency exists. But gathering weather reports on a regular daily basis is a no no, and as a result many of our weather nets will have to close, unless by some mental and legal gymnastics they are able to say they are only exchanging the information among themselves, and if anyone wants to pass it on to NWS, it's that person's business.

The FCC did offer an alternative, however. It suggested that NWS might establish an affiliate system like that of MARS using U.S. government frequencies, and itself authorize their use by amateur stations as NWS auxiliaries. This already has a long-standing precedent, for many years ago the FCC made available to licensees in several of the land mobile services government frequencies in the 169.4-172 and 402-406 MHz bands for this very purpose. If the NWS wants our help, it could take steps to have suitable frequencies made available in one way or another for this purpose, frequencies near enough to an amateur band for us to be able to reach it without need for additional equipment. Hams at sea could use these frequencies for routine weather reports (even the fact that winds are calm and seas are smooth can be important to a meteorologist trying to delineate the area affected by a storm). But the FCC says that can't go by Amateur Radio.

VACUUM TUBES

Harry Hyder, W7IV, tells in September QST how to build the classic two-tube regenerative receiver that was the workhorse of Amateur Radio back in the 1920s and 30s. It is hard to find a type 24A or 56 tubes that I used in the receiver for my first QSO as W8UFD back in 1939, but there are still tubes around that have suitable characteristics for such receivers. In fact many of the triode-pentode tubes used in the later tube type TV sets could be used to construct a one tube receiver.

Don't sell those old bloopers short. They often match anything we have today in sensitivity. Why would anyone want a regenerative receiver these days? It could be a life saver in an emergency. Such a receiver can be assembled in a mater of a few hours if the needed parts are available. CW transmitters using tubes are even simpler build.

DECEMBER TRAFFIC

The month of December is always the big traffic month, and seems to get bigger every year. In addition to the usual traffic load which already tends to be heavier in winter, lighter in summer, there is the huge volume of holiday traffic. One suspects that as postal rates keep rising, more people turn to amateur radio to send their greetings. Amateurs seem to be doing little to discourage such use of our services, rather many are actually encouraging it. Amateur groups set up exhibit stations to solicit traffic from shoppers in malls and similar places, and usually collect impressive amounts to add to the total.

And this is all to the good. In October the ARRL sponsors the Simulated Emergency Test (SET), which does provide a good exercise for the local groups who are the ones most likely to be needed in an emergency situation, but it's not so realistic for the nation-wide system. December is more like it, with large volumes of traffic coming from various places in big chunks, and destined for just about anywhere that amateur radio is allowed to handle third-party traffic, and with the kind of difficulties that would be encountered in dealing with the public in such a situation. It's much like what an amateur might encounter at a Red Cross shelter collecting welfare messages: explaining to people what you can and cannot do, getting proper addresses, helping people to write messages, recording names and phone numbers of senders, handling all the paper work that goes with traffic, sorting messages by destination, and actually handling the messages on the air. True, the texts are not what you would be handling in an emergency, but there isn't much difference for the stations handling the messages between "Merry Christmas" and "Red Cross needs more blankets." In both cases the objective is to move the traffic as efficiently as possible and without error.

ORGANIZING A SHOW STATION

Show stations, set up in shopping malls and such places, offer an opportunity to give amateur radio some needed publicity, provided the work is done competently. We must never forget that it is only by prompt, accurate, courteous delivery that we convey the image we desire. Originating the messages is only the beginning of the story. The job isn't done until the message is in the hands of the addressee within a reasonable time, and exactly as originated by the

sender.

To succeed, it's necessary to have enough people on hand who know what they are doing, and to organize for efficient operation. Those who receive the messages from the public need not be licensed, but must be able to relate to people, and also must understand how to prepare messages. There should be others, who also need not be licensed, who will take care of the sorting and filing, and these must understand traffic routing. The operators, of course, must be licensed, and should be experienced traffic handlers in the mode they will be using. If the operation is a large one, there may be need for utility personnel to keep the coffee pot filled, to run errands, to replenish supplies of forms, pencils, handouts. There should be enough operators to keep shifts to a reasonable time, say two hours. Exactly how many will be needed depends on so many factors that only experience can provide an answer. Under reasonably good conditions a competent CW or voice operator can clear about thirty messages an hour, and that can be a guideline to help determine how many will be needed.

As this column deals with traffic, the traffic aspect of a show station is discussed here. But a show station need not include opportunities for the public to originate messages, in fact it is better not to include traffic handling at all than to do it badly. Some other aspects that can be included are amateur TV, FAX, digital communications, satellite communications, DX, experimentation.

By all means let anyone who wishes know how to become a radio amateur, when and where classes are held, tests given. Many have found that having a telegraph key and buzzer or code practice oscillator located where the public can handle it, with a chart of the morse code close by, draws a lot of attention as visitors try to send their names. Another attention getter is to have the audio from the CW operating position fed to a speaker so that those passing will hear it, and if you have an operator available, copy it on a typewriter so placed that visitors can look over the operator's shoulder to read what is being copied.

There is still one important item in planning an exhibition that includes traffic handling, organizing the support stations to take the traffic. If the operation is expected to generate any sizeable amount of traffic, say twenty or more messages a day, it will be too much to handle efficiently by just going on the air and putting it into nets, particularly at the holiday season when the nets are already heavily loaded. Instead, line up active traffic handlers who can keep special schedules with the exhibit station and pick up anything destined for areas they can serve effectively. In that way the show station can pass traffic on a continuous basis and not be constrained by net schedules set by others, not have to wait while other stations on nets clear their traffic, and the traffic will stand a better chance of avoiding the bottlenecks that could delay it unnecessarily. Where do you get such people? Active traffic handlers will usually know, ask them. Your Section Traffic Manager or any officials of the National Traffic System, net managers or TCC directors, will be able to help too.

What mode to use? Voice seems to be the one most often employed. It's one people understand, it's easier to recruit the operators, and it's quite easy to pass the traffic to a local station on VHF. But it also runs the risk of being confused with the "other service." RTTY and packet have the advantages of speed and greater accuracy and can be used to great advantage when the loads are really heavy, clearing hundreds of messages per hour, but they lack the personal touch that many of our "customers" appreciate when messages travel by amateur radio. CW is something that gets attention, a real crowd stopper, something that seems to belong to another age, like tom-toms or smoke signals, something that most people don't know is still used at the end of the twentieth century. The most important consideration, however, when selecting the mode to be used is which mode or modes will most effectively move the traffic, considering the equipment and personnel available and the location of the station.

SERVICE MESSAGES

If you operate an exhibit of this kind, you are almost certain to receive some service messages later advising you that such-and-such a message could not be delivered. You should have a file of all the messages sent out, with the name, address, and telephone number of the sender. What if the sender is someone who lives a thousand miles away, just happened to be in town at the time, and has by now returned home? Send a radiogram to that person saying what happened and asking for further instructions (ARL SEVEN). Amateur Radio's traffic service looks best when the messages go through the system without a hitch, but our image as competent communicators is also enhanced when we are seen as carefully following those that stray and doing our best to deliver them too.

And, while on the topic of sending greetings for others, your columnist sends his greetings to all his readers, wishing them the greatest holiday season ever and the best of everything throughout 1987. (K4ZN)

ALTERNATE ENERGY SOURCES

Chuck Clark, K4ZN

On several occasions my articles have treated alternate energy sources for powering amateur stations, mainly for emergency communication. I have also mentioned the possibility of using such alternate energy sources to provide standby power for the whole household. Two developments that have appeared in print recently promise to change not only the alternate energy sources used by amateurs to power their stations, but may even have a significant impact on the entire electric power industry in the 1990s, resulting in a new concept in the generation and distribution of electrical energy.

SOLAR POWER

Under date of September 9, the New York Times carried an article about a new photovoltaic material being developed by Alvin M. Marks working with Westinghouse. Marks does have impressive credentials, the holder of over one hundred patents in addition to the two he received in connection with the present project. Some of his previous patents cover processes for making 3-D movies and the film used in polarized sunglasses. He was also an energy adviser to president John F. Kennedy.

The Marks solar panels are made of a material he calls Lumeloid, a plastic sheet covered with conductive polymers, molecules made up of long

strings of atoms. His company, Phototherm, for competitive reasons does not identify the chemicals used to make Lumeloid. It is not so reticent, however, in discussing the advantages of the product. It is far less expensive to produce than silicon cells, on the order of fifty cents per watt as against fifteen dollars for silicon. The company also claims efficiencies of 70 to 80 percent where silicon cells usually convert about fifteen percent of the sunlight into electrical energy. When one recalls that commercial electric systems cost a dollar and up per watt, it can be seen that if these claims are true and can be realized in practice it will become more economical for the individual household to generate its own power direct from sunlight. Huge power plants and transmission lines and substations may be headed for the museum. The textbooks on electric power generation and transmission will have to be rewritten.

Direct sunlight delivers a maximum of about 100 watts per square foot, and so an 800-square-foot house could generate 80 kilowatts at high noon on a clear day, far more than it could use. But power is needed at other times, and so some way to store the energy is also needed. We have storage batteries for that purpose, but their cost would more than consume the savings generated by the solar panels. The energy is lost in charging and discharging the batteries and also in converting the energy to the 120 volts AC which appliances are designed to use. Still, even if only 200 kilowatt hours are generated during the day and 50 percent of the energy is lost, the output of the system would be around 3000 kilowatt-hours per month, enough to operate many households. The only question is the storage batteries.

STORAGE BATTERIES.

The october issue of Popular Science in its "Electronics Newsfront" department tells about a battery using a pyrrole polymer, a plastic battery being developed by the German BASF firm, that can be molded in any shape, recharged up to 500 times and burned for disposal when depleted. Nothing was indicated as to price, however. Yet it would appear that either of these materials could be competitive with any other energy source if mass produced, as it appears likely they will be: the companies hope to be producing them within two or three years.

Even if these first designs prove not to meet such high expectations, they are blazing a new trail in electric power production, the use of organic materials where heretofore inorganic materials, copper, zinc, lead, manganese, silicon, lithium, sulfuric acid, potassium hydroxide, and the like have dominated. I have always wondered whether organic materials might possibly serve to produce better solar cells and/or solar batteries. Apparently they can, and it has been mainly inorganic simplicity that has discouraged efforts to use complex compounds of organic chemistry. In addition to the lower price tag, organic materials offer advantages of lighter weight, safety for the users, and use of renewable resources. It is quite likely that these two developments will prove to be only the beginning and will be followed by many that will further improve the efficiency and reduce the cost. If it is possible to make photocells using organic materials, the same materials might also find use in other semiconductor devices, diodes, transistors, integrated circuits. To think that politicians wanted to save money by closing the Patent Office, "because everything worth patenting has already been invented!" (K4ZN)

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.250	.058	4.43	1.500	.058	33.37
.375	.049	6.37	1.500	.125	68.58
.375	.058	7.34	1.625	.058	36.29
.500	.035	6.48	1.625	.125	74.84
.500	.058	10.26	1.750	.058	39.20
.625	.058	13.07	1.750	.125	81.00
.625	.125	24.95	1.875	.058	42.01
.750	.058	15.98	2.000	.058	44.93
.750	.125	31.21	2.000	.065	50.22
.875	.035	11.77	2.000	.125	93.53
.875	.058	18.40	2.250	.065	56.59
1.000	.058	21.82	2.500	.065	63.18
1.000	.125	43.63	3.000	.065	76.14
1.125	.058	24.73	3.250	.125	155.84
1.125	.125	49.90	3.500	.125	168.37
1.250	.058	27.54	4.000	.065	102.06
1.250	.065	30.78	4.500	.065	115.02

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KH6BZF PROPAGATION REPORT

Lee Wical, 45-601 Luluku Rd; CRT #44-25, Kane'Ohe, HI 96744

The first diagram shows the value of solar flux (top curve) and SSN - sunspot number (bottom curve). The Y axis and scale is the same for both. The X axis is calibrated in days of the month.

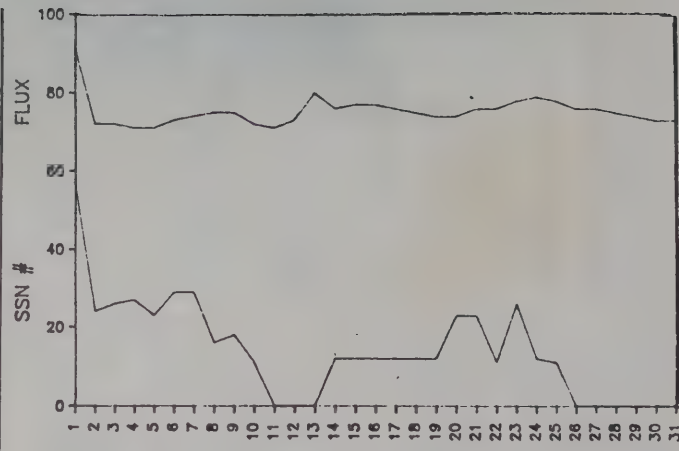
The second diagram shows variation of the Alpha Index for each day - an area limited by two curves. [i.e. A_r and A planetary (world value)]

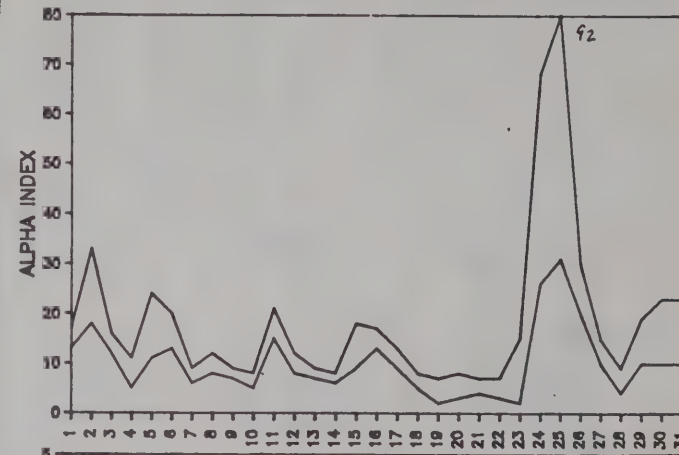
The third diagram shows the propagation quality (CONDX), where the scale is: 5 = Above Normal, 4 = High Normal, 3 = Low Normal, 2 = Below Normal, 1 = Disturbed.

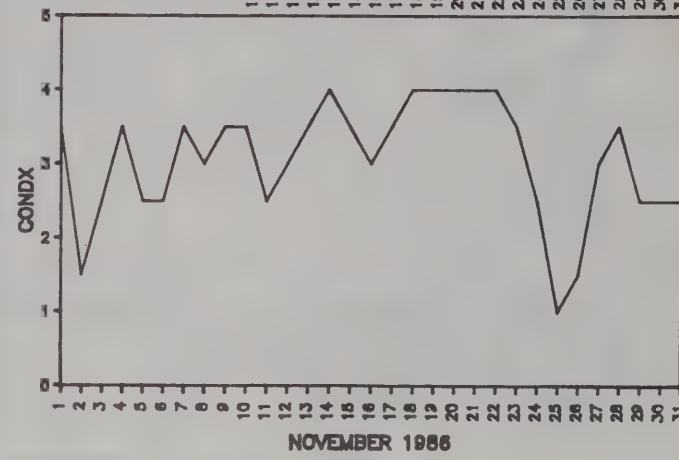
The Geomagnetic Field Level scale reads as follows: 0 = Very Quiet, 1 = Quiet, 2 = Unsettled, 3 = Active, 4 = Minor Storm, 5 = Major Storm.

To make your own forecast look at the diagrams and tables for values 27.5 and 55 days ago, also check the WWV transmissions (18 minutes after the hour) for daily values and make your own accurate predictions.

Statistical information is compiled by KH6BZF and processed on a computer by VE3BMV/W2.







THOUGHTS FROM THE RAINBOW BAY:

"MY BEST OF HOLIDAY GREETING TO YOUR HOME FROM OUR HOME..." "MELE KALIKIMAKA E HAOLE MAKAHIKI HOU"
NEVER, NEVER RAISE YOUR HAND TO A PROPAGATIONIST.... IT LEAVES YOUR GROIN UNPROTECTED
AS A PROPAGATIONIST... I'M NOW WORKING ON A FASCINATING PROJECT... STAYING ALIVE!!! ... YES, SLOWLY BUT SURELY... I', GETTING... NOWHERE!!!

1986 NOV	CNDX	SOLAR FLUX	LEVEL	O SSN#	GEOM.L FM	GEOM.L TO	ALPHA FROM	ALPHA TO	K	NOTES
1	3.5	91	VY LOW	57	2	2	13	17	2	RGN4751(01)S27;W86 4753(02) 4754(03) 4755(11)
2	1.5	72	|	24	2	2	18	33	4	RGN4746(02)N07;E33 RGN4747(02)N35;E48
3	2.5	72	|	26	2	1	12	16	1	RGN4746(02)N08;E21 RGN4747(03)N35,E37
4	3.5	71	V	27	4	4	5	11	2	RGN4746(02)N08;E08 RGN4747(04)N35,E21
5	2.5	71		23	3	4	11	24	2	RGN4746(01)N07;W01 RGN4747(02)N34,E13
6	2.5	73		29	3	1	13	20	2	RGN4746(00)N07;W15 RGN4747(07)N34,W05
7	3.5	74		29	4	4	6	9	1	RGN4747(08)N35;W18 RGN4748(01)S03,W08
8	3.0	75		16	4	3	8	12	3	RGN4747(06)N34;W26
9	3.5	75		18	4	4	7	9	2	RGN4747(08)N35;W43
10	3.5	72		11	1	1	5	8	1	RGN4756(01)N01;W44
11	2.5	71		0	2	4	15	21	2	NO SUNSPOTS
12	3.0	73		0	2	3	8	12	2	NO SUNSPOTS
13	3.5	80		0	1	1	7	9	2	NO SUNSPOTS
14	4.0	76		12	1	1	6	8	1	RGN 4757(02)N25;E75
15	3.5	77		12	2	2	9	18	3	RGN 4757(02)N23;E61
16	3.0	77		12	2	2	13	17	3	RGN 4757(02)N23;E49
17	3.5	76		12	2	1	9	13	2	RGN 4757(02)N23;E36
18	4.0	75		12	1	1	5	8	2	RGN 4757(02)N23;E24
19	4.0	74		12	1	1	2	7	2	RGN 4757(02)N23;E10
20	4.0	74		23	1	1	3	8	1	RGN 4757(02)N24;W04 4758(01)N26;W32
21	4.0	76		23	1	1	4	7	2	RGN 4757(01)N24;W17 4758(02)N26;W22
22	4.0	76		11	1	1	3	7	1	RGN 4758(01)N25;W49
23	3.5	78		26	1	4	2	15	2	RGN 4758(02)N28;W60 4759(04)S27;W72 MIN ST.22
24	2.5	79		12	4	1	26	68	3	RGN 4759(02)S28;W86
25	1.0	78		11	3	5	31	92	6	RGN 4759(01)S28;W99 PCA @0700Z
26	1.5	76		0	1	4	20	30	3	NO SUNSPOTS
27	3.0	76		0	3	1	10	15	4	NO SUNSPOTS
28	3.5	75		0	1	1	4	9	1	NO SUNSPOTS
29	2.5	74		0	1	2	10	19	3	NO SUNSPOTS
30	2.5	73		0	1	3	10	23	3	NO SUNSPOTS

CONTEST RULES

FRANK ANZALONE, W1WY
CQ Magazine
14 Sherwood Road, Stamford, CT 06905

Calendar of Events

*	Jan.	1	AGCW Happy New Year Pty
*	Jn.1-	De.31	UBA SWL Competition
*	Jan.	3-4	"73" 10 Meter SSB Champ.
*	Jan.	10-11	"73" 15 & 20 SSB Champ.
	Jan.	10-11	European YL-OM Contest
	Jan.	10-12	ARRL VHF Sweepstakes
*	Jan.	17-18	"73" 160 M SSB Champ.
	Jan.	17-18	Hungarian DX Contest
	Jan.	17-18	AGCW-DL QRP CW Contest
	Jan.	17-18	Crazy 8's HF, VHF, UHF
	Jan.	17-18	Texas QSO Party
	Jan.	17-18	North Dakota QSO Party
	Jan.	23-25	CQ WW 160 M CW Contest
*	Jan.	24-25	"73" 40 & 75 SSB Champ.
	Jan.	24-25	French CW Contest
	Jn.31	- Fb.1	YL ISSB CW Party
	Feb.	1-2	Classic Radio Exchange
	Feb.	7-8	RSGB 7 MHz Phone Contest
	Feb.	7-8	QCWA CW QSO Party
	Feb.	7-8	Vermont QSO Party
	Feb.	7-8	New Hampshire QSO Party
	Feb.	14-15	Dutch "PACC" Contest
	Feb.	14-16	YLRL YL-OM Phone Contest
	Feb.	20-22	CQ WW 160 M SSB Contest
	Feb.	21-22	ARRL DX CW Contest
	Feb.	21-22	RSGB 7 MHz CW Contest
	Fb.28	-Mr.1	French Phone Contest
	Fb.28	-Mr.2	YLRL YL-OM CW Contest
	Mar.	7-8	ARRL DX Phone Contest
	Mar.	7-8	QCWA Phone QSO Party
	Mar.	14-15	Maine QSO Party
	Mar.	15	ZERO District QSO Party
	Mar.	21-22	YL ISSB Phone Party
	Mar.	21-23	BARTG Spring RTTY
	Mar.	28-29	CQ WW WPX SSB Contest

** Covered last month.*

Crazy 8's HF, VHF, UHF Contest

1400Z Sat. to 2300Z Sun., Jan. 17–18

As the name implies, this is a crazy one organized by the Cuyahoga Falls ARC of Ohio.

Stations in the 8th call district can work everybody. Those outside the district work 8th district stations only.

Use all bands, all modes, and all types of transmission.

Exchange: State or province and grid locator.

Scoring: One point per QSO on each band and mode.

Multiplier: There are two groups of multipliers. Group 1—Bands used, grid squares worked, and states worked. Group 2—Number of modes and type of contacts made.

Final Score: Total QSO's times the Group 1 and 2 multiplier. There are 19 multipliers available.

(As I said, this is a crazy one. You'll never make it without an official scoring sheet. Better send a large SASE to KA8NRC for details.—ed.)

Awards: All entrants will receive a certificate of participation (enclose a 37¢ SASE). Plaques to the top scorers in and outside the 8th district, plus other various awards.

Send your logs and requests to: Anthony Luscre, KA8NRC, 5441 Park Vista, Stow, OH 44224.

Texas QSO Party

0000Z Sat. to 1800Z Sun., Jan. 17–18

There was no Texas QSO Party in 1986. However, the West Texas DX Association has reactivated the party and indicated it will continue in the future.

The same station can be worked on each band and each mode, and mobiles in each county change. Single operator only.

Exchange: QSO no., and QTH. County for Texas stations. State, province, or country for others.

Scoring: Texas stations score 1 point per QSO on phone, 2 points if on CW, fixed or mobile. (In-state contacts permitted for QSO and multiplier credit.) Non-Texans same as above. However, Texan phone mobiles are worth 5 points, CW mobiles 7 points.

Multiplier: Texans use states, VE provinces, DX countries, and Texas counties. Non-Texans use Texas counties (maximum of 254).

Frequencies: CW—3565, 7065, 14065, 21065, 28065. Phone—3940, 7260, 14280, 21370, 28600. Novice—3710, 7110, 21110, 28110.

Awards: Certificates to the top scorers in each state, VE province, and DX country, and top 10 Texas stations. There are also plaques for the overall winners in seven different areas: U.S., U.S. Novice, DX, VE, Texas fixed, mobile, and Novice stations.

All logs must be received by March 14th. This year they go to: Les Bannon, WF5E, 3400 Bedford, Midland, TX 79703.

AGCW-DL QRP CW Contest

1500Z Sat. to 1500Z Sun., Jan. 17–18

This is the winter edition of this QRP contest organized by the AGCW-DL. It's a CW only on all 6 bands, 10–160 meters. The same station can be worked on each band for QSO and multiplier credit.

There are five classes as follows:

A. Single Op.—3.5 watts or less.
B. Single Op.—10 watts or less.
C. Multi-Op.—10 watts or less.
D. QRO stations, over 10 watts.
E. SWL's.

Multi-operator stations may operate the full 24 hours. All other classes must take a 9-hour break.

Exchange: RST, QSO no., and power input. Add × if transmitter is crystal controlled (559001/5×, QRO stations 579002/QRO).

Points: QSO with own country, 1 point. Other countries own continent, 2 points. DX outside own continent, 3 points. Crystal-controlled stations are limited to 3 crystals for each band, and take double above points.

Multiplier: One for each country and one for each DX contact. For scoring purposes call areas in JA, PY, VE, VK, W/K, and ZS are counted as multipliers.

Final Score: Total QSO points times the multiplier on that band. Add the sum of scores from each band.

Awards: Certificates to the first three places in each class on each band. Use a separate log for each band.

All entries must be received no later than six weeks after the end of the contest. Include 1 IRC for copy of results.

Entries go to Siegfried Harl, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, Fed. Republic of Germany.

Hungarian CW Contest

2200Z Sat. to 2200Z Sun., Jan. 17–18

This is an annual affair organized by the Hungarian Radioamateur Society to promote better relations between HA's and amateurs in other countries.

Classes: Single operator, both single and all band, and multi-operator all band (club stations).

Exchange: RST and QSO contact number starting with 001. HA stations will also add two letters to identify their county. There are 20 counties: BA, BE, BP, BN, BO, CS, FE, GY, HA, HE, KO, NO, PE, SA, SO, SZ, TO, VA, VE, ZA.

Points: Contacts with HA stations count 6 points. With other stations outside own continent, 3 points. Same station may be worked on each band for QSO points.

Multiplier: Each different HA county worked on each band.

Score: Total QSO points from all bands times the sum of the multipliers from each band.

Frequencies: 3500–3590, 7000–7035, 14000–14090, 21000–21090, 28000–28090 kHz.

Awards: Certificates to the top scorers in each class in each country. Additional awards if returns justify.

Use a separate log sheet for each band and include a summary sheet showing the scoring, etc. The usual signed declaration is also requested.

Mail your entry within six weeks from the end of the contest to Hungarian Radioamateur Society, Contest Bureau, P.O. Box 86, H-1581 Budapest, Hungary.

North Dakota QSO Party

0000–0800Z & 1600–2400Z Sat., Jan. 17
0800–1600Z Sun., Jan. 18

Sponsored by the Red River Radio Amateurs of Fargo, North Dakota, this one will make one of the rarer states available for WAS and County Hunters.

The same station may be worked once on each band and each mode.

Exchange: RS(T), QSO no., and QTH. County for ND stations; state, province, or country for others.

Scoring: Count 10 points for phone QSO's, 20 points for CW, and 50 points for RTTY. ND stations add 250 bonus points for working 5 Novices.

Final Score: ND stations multiply total QSO points from all bands by sum of states, provinces, and countries worked per band and mode. Others multiply by total number of ND counties worked (maximum of 53).

Frequencies: CW—1810, 3540, and 35 kHz up from edges on other bands. Phone—1810, 3905, 7280, 14295, 21380, 28500. Novice—25 kHz up from edges of Novice bands.

Awards: None mentioned, but include a large SASE with your entry for a copy of the results to see if you won anything.

Mail logs by February 28th to Mike Beaton, KDØA, 2267 Flickertail Drive, Fargo, ND 58103.

CQ WW DX 160 Meter Contest

CW: Jan. 23–25 SSB: Feb. 20–22
2200Z Friday to 1600Z Sunday

Complete rules were published in the November issue and are the same as those used in previous years.

We are still advocating the use of the DX Window and are very critical of those abusing this long-established and recognized "gentlemen's agreement."

Briefly repeating the rules, they are as follows:

Classes: Single and multi-operator.

Exchange: RS(T) and QTH. State for U.S., province or call area for Canada. Not necessary for DX to spell out their country, but it is recommended that only standard prefixes be used in their call.

Scoring: Contacts with stations within own country 2 points, with other countries but in same continent 5 points, with other continents 10 points.

Multiplier: Each U.S. state (48), each Canadian area (13), and each DX country (ARRL and WAE lists).

Awards: Certificate to top-scoring station in each state, Canadian area, and DX country.

The disqualification clause for excessive duplicate contacts and other violations is still very much in effect.

Include a summary sheet with your entry showing the scoring and other essential information, and a signed declaration that all rules and regulations have been observed.

Mailing deadline for CW entries is February 28th, and March 31st for the SSB section. They can be sent directly to the 160 Contest Director, Don McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32904. And, of course, they can be sent to the *CQ* office, 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. *(Be sure to indicate CW or SSB on the envelope.)*

French DX Contest

CW: Jan. 24–25 SSB: Feb. 28–Mar. 1

This year's announcement from the REF showed no change from last year's format. It's still the world working the French Europeans as well as the other French departments and territories all over the world. The French areas can usually be identified by the letter "F" in the prefix.

Classes: Single operator and multi-operator. Multi stations must remain on the same band at least 15 minutes.

Exchange: RS(T) plus a 3-figure QSO number starting with 001. French stations will also include two figures or letters identifying their department.

Points: One point per contact between stations in the same continent, 3 points if with other continents.

Multiplier: Each French European department (95) and each overseas department and territory worked. Also DA1 and DA2 French Army, 2A and 2B Corsica, and the Club station F6REF.

Final Score: Total QSO points from all five bands (3.5–28 MHz) times the sum of the multipliers from each band.

Awards: Certificates to the top scorers in each country. European single operator must make at least 100 QSOs; multi-operators 250 QSOs. All other areas 50 QSOs for single operator, 100 QSOs for multi-operator.

Stations making over 250 contacts must include a dupe check list with their log. The usual disqualification rules for excessive duplicate contacts and other violations will be strictly enforced.

All entries must be postmarked no later than March 5th for CW and April 5th for SSB. This year they go to The REF Contest Committee, Att: Lucien Aubry, F8TM, 53 Rue Marceau, 91120 Palaiseau, France.

YL ISSB QSO Party

CW: Jan. 31–Feb. 1 SSB: Mar. 21–22
0001Z Saturday to 2359Z Sunday

The party is open to all, but the emphasis is on membership participation.

Categories: Single operator, DX-US Partners, and YL-OM Teams.

Exchange: Call, RS(T), QTH (state, prov., terr., dist. or country), name, ISSB number, YL-OM teammate, DX-US partner.

Points: One point for non-member contacts, 3 points for member contacts on the same continent, and 6 points if in a different continent.

Multiplier: Only contacts with member stations count as a multiplier. There are ten different categories. Get the list from WA9AEA.

Frequencies: The General portions of the CW and phone bands, 10 through 80 meters. Avoid 14332 used by ISSB Net. Check 40 and 80 hourly. VHF and UHF may be used simplex.

Awards: Category and QTH area winners.

Logs: Should be set up as outlined in the exchange and should indicate at least two 6-hour rest periods. A summary sheet showing the scoring and other essential information would be helpful.

Mailing for all entries is April 30th, and they go to: Bill Early, WA9AEA, P.O. Box 401, McHenry, IL 60050-0401.

(Note: Rules and logging format are much too lengthy and complicated to list here. Strongly suggest you send a large SASE to WA9AEA for more details.—ed.)

Classic Radio Exchange

2100Z Sun. to 0400Z Mon., Feb. 1–2

This is the winter edition of this unusual event. The format is still the same as it has been for the past years. Object is to restore and operate older equipment with like-minded hams, not required in the exchange, but a distinct advantage in the scoring.

A classic radio is any equipment at least 10 years old.

The same station may be worked on each band and each mode, and with different equipment combinations. Non-contesters may be worked for credit also.

Exchange: Name, RS(T), QTH, receiver and transmitter type, and other interesting conversation.

Scoring: Multiply total QSOs by total number of receivers, transmitters, state/provinces/countries worked on each band and mode. Multiply that total by your Classic Multiplier, the total age of all receivers and transmitters used. Three QSOs minimum per unit. Multiply age by two if gear is a transceiver.

Frequencies: CW—60 kHz up from low edge of band. Phone—3910, 7280, 14280, 21380, 28580. Novice/Tech.—3720, 7120, 21170, 28120.

Awards: Certificates and appropriate memorabilia are awarded for highest scores, longest DX, exotic equipment, best excuses, and other unusual achievements.

This year send your log, comments, anecdotes, pictures to: Jim Hanlon, W8KGI, 5560 Linworth Road, Columbus, OH 43085. Include a large SASE for a copy of the "Classic Radio Newsletter" with the results.

RSGB 7 MHz Contest

SSB: Feb. 7–8 CW: Feb. 21–22
1200Z Saturday to 0900Z Sunday

It's the world working the British Isles on SSB 7.040–7.100 and CW 7.000–7.030 MHz. (How about the US on SSB, split frequency?)

Following rules are for areas outside the British Isles.

Exchange: RS(T) plus a serial number starting with 001.

Scoring: Europeans get 5 points for each B.I. contact. All other areas earn 15 points per contact.

Multiplier: All other areas count each different B.I. prefix worked (i.e., G2, GD3, GI4, etc.). Total of 49 available.

Final Score: Total QSO points times the total prefix multiplier worked.

Unmarked duplicate contacts will be penalized 10 times the number of points claimed. Logs containing more than 5 unmarked duplicates will be disqualified.

There is an SWL section. Only B.I. stations are to be logged. Scoring same as above. The same station may be logged only once, and the station being worked may only be repeated once in every three contacts logged.

Awards: Certificates of merit will be awarded to the first, second, and third place scores to European and to non-European stations.

Include a summary sheet showing the scoring and other essential information, including the usual signed declaration that all rules and regulations have been observed.

SSB logs must be received by March 30th, CW logs by April 20th. They go to: HF Contests Committee, P.O. Box 73, Lichfield, Staffs., WS13 6UJ England.

1986 French DX Contest
U.S.A. and Canada Results

W1OPJ	507	K2SX	28,178
W3FQE	440	W3ARK	19,803
KA7FET	3	K1BV	9,492
VO1AW	18,156	W8KV	8,366
VE3XN	12,815	N8FU	7,434
VE3ST	7,560	KA1DWX	6,364
VE2EDK	4,958	KA8TVS	2,184
*VE2UMS	44,550	WA2UDT	1,005

KB8KJ	147
VE3XN	12,444
VE2AFC	120

*Multi-opr.
(Overseas logs received: CW 309, SSB 130.)

Results of the 1986 CQ 160 Meter CW and Phone DX Contests

BY DONALD MCCLENON*, N4NN

Plaques

Single Operator

CW

World by K5AAD. Winner: CT3BZ, operated by Martti Laine, OH2BH.

USA by N4PN (W8AW Memorial). Winner: W1CF operated by Joseph B. Krone, WA2SPL.

Europe by K4SB. Winner: G3SZA, Dave R. Wilson.

Asia by WD4RCO. Winner: 4X4NJ, Riki Kline.

Phone

World by K5AAD. Winner: LZ2CJ, Wally Stefanoff.

USA by K4JRB. Winner: K1ZM, Jeffrey T. Briggs.

Europe by N4IN. Winner: LZ1KOZ, Plamen Nikolaev Ivanov.

Oceania by Dixie DXers. No entrant.

Multi-Operator

CW

World by N4RJ. Winner: GW3YDX, Ron G.D. Stone.

Phone

World by S.E. DX Club. Winner: W3BGN, Steven Sussman.

Top 10 Scores

Top 10 W/VE Single Op. CW		Top 10 W/VE Single Op. Phone	
W1CF	486,591	VE3MFA	210,848
(WA2SPL Op.)		K1ZM	209,757
K5NA	423,600	WB9HAD	196,575
AA1K	414,953	K9UWA	157,157
VE3BVD	390,780	K8HA	147,980
KT3M	388,833	WB3GCG	138,525
VE6OU/VE3	320,489	W8ZV	132,480
W3BGN	303,042	AA1K	108,832
K3ZO	282,341	VE3PN	98,637
VE1ZZ	219,240	WB8SCD	83,862
KM3T	208,492		

Top 10 DX Single Op. CW		Top 10 DX Single Op. Phone	
CT3BZ	732,354	LZ2CJ	279,258
(OH2BH Op.)		LZ1KOZ	89,257
G3SZA	439,461	YV2IF	71,820
W1BIH/PJ2	377,225	XE1VIC	66,462
HK1AMW	225,709	UC2IDC	53,618
EA9EU	207,365	4X4NJ	50,266
I2UBI	200,531	PA3DFT	48,117
4X4NJ	196,098	VP5Z	45,375
YU3EA	188,340	IV4PRK	42,615
UG6GAW	171,216	OE1DH	40,280
YU3EF	167,418		

Top 10 Multi-Op. CW		Top 10 Multi-Op. Phone	
GW3YDX	552,126	W3BGN	200,070
YU1EXY	306,852	KC8MK	199,342
EA3VY	252,560	GW3YDX	194,432
YT2R	236,082	OK3KFO	167,895
GM3IGW	228,998	K1NG	164,794
W8JI	226,670	W8CEM	155,960
N9MM	222,754	VP9AD	153,420
K3ND	218,463	W8RA	126,820
KH6RS	211,848	VE3KRP	107,240
W9RE	187,880	N4FNB	102,843

Courtesy of CQ Magazine

CW Contest—January

All 50 states, 11 provinces, and 108 countries were active. No valid VO2 or VE8 stations were reported. PEI, VY, and perhaps SD were among the rarest. Any of the following active prefixes were good catches for W/VE: all Russians, CO, CX, EA6, EA8, EA9, FP, GD, GJ, GU, HL, IS, IT, J3, J7, JW9, KH2, KP4, LA, LX, OH0, OY, P29, PZ, T7, TF, TK, VS6, XX9, ZB, ZS, 4U1I, 5B4, 9H1, 9L1, 9M2, 9Y4. There were 15 more countries on than last year.

Single operator Martti Laine, OH2BH, operating CT3BZ, set a new record world-high score of 732,354 points. No one could beat an excellent op in an excellent location, where most of his QSOs were 10-pointers. Second world high was multi-op GW3YDX at 552,126, far above his last year top-spot score. Also above last year's top were single ops W1CF (WA2SPL Op.) 486,591; G3SZA 439,461; K5NA 423,600; AA1K 414,953; VE3BVD 390,780; KT3M 388,833; and W1BIH/PJ2 377,225. Single VE6OU/VE3 320,489; multi YU1EXY 306,852; and single W3BGN 303,042 complete the list of over 300K scores. Top 10 scores in the W/VE Single Operator, DX Single Operator, and World-wide Multi-Operator categories are shown in the score boxes.

QSO leaders were AA1K 998, W1CF (WA2SPL Op) 987, KT3M 925, K5NA 917, VE3BVD 864, GW3YDX 846, N9MM 843, W8JI 800, K9RS 795, N5RZ 793, W8AIH 773. Outside W/VE QSO leaders were GW3YDX 846, CT3BZ 694, G3SZA 629, YU1EXY 579, YT2R 511, I2UBI 505. High contact totals outside N.A./EU were CT3BZ 694, W1BIH/PJ2 482, KH6RS 383, HK1AMW 322, UG6GAW 315, UL7MAN 312, EA9EU 311, 4X4NJ 279, UL7OB 278, UA9CBO 246.

Multiplier leaders were K5NA 120; AA1K, W1CF 119; KT3M 113; CT3BZ 106; VE1ZZ 105; K3ND, K3ZO, N4IN 103; W3BGN, GW3YDX 102; N4PN 100. Last year's top was 102. DX multiplier leaders not shown above were YU1EXY 84; EA3VY 80; W1BIH/PJ2 79; GM3IGW, YT2R 77; 4X4NJ, G3XTT 74; OK1KSO, YU3EA 73.

Countries worked leaders were GW3YDX 70; CT3BZ, K5NA 65; AA1K, G3SZA 63; W1CF 62; KT3M 58; YU1EXY 57; UR1RWX, UZ6LWZ 56; OK1KSO, UP1BWR 55. With Franz Josef Land being such a rare and exotic multiplier, a special tribute goes to VE5UF for confirmed QSOs with *two* of them!

We are fortunate to have many new plaque sponsors this year. Sponsors and trophy winners for both modes are shown in the special plaques box. Single and multi-op winners in each state, province, and country will receive *CQ* certificates.

Phone Contest—February

Just the opposite of last year, most found the first night much better than the second, but it was not a very good DX weekend. Not many worked all states, but there were a number of active stations in all of them. KL7 and KH6 were usually the toughest. PEI, VE6, and VY1 were on but not worked by many. No valid VO2 or VE8 was recorded. From a W/VE standpoint the following would be good catches from the 94 active countries: all Russian prefixes, C31, EA6, EA8, EA9, EI, GD, GU, HC, HH, HK0, IS, IT, J3, KP4, KX6, LU, LX, PJ2, PJ7, SV5, SV9, T7, VU, YK, ZP, ZS, 5B4, 9H1.

The following numbers of active stations were recorded from each country having 10 or more participants:

Country	Stations	Country	Stations
W	2560	UQ	21
UB	742	HB	19
UA	700	SP	18
G	400	PA	17
VE	187	SV	16
UA9	131	GM	15
I	91	UI	14
DL	54	HK	13
OK	54	OH	13
UP	41	UF	13
UL	38	UM	12
UC	35	LZ	12
YU	27	UO	11
OE	26	UR	10
EA	23	Others	238
GW	22	Total	5556

Poor conditions kept the big scores well below those of last year. Single operator Wally Stefanoff, LZ2CJ, has the world-high score of 279,258. The next 11 were as follows, with asterisks denoting multi-op stations: VE3MFA 210,648, K1ZM 209,757, W3BGN* 200,070, KC8MK* 199,342, WB9HAD 196,575, GW3YDX* 194,432, OK3KFO* 167,895, K1NG* 164,794, K9UWA 157,157, W8CEM* 155,960, VP9AD* 153,420. Top 10 scores in the W/VE single operator, DX single operator, and world-wide multi-operator categories are shown in the score boxes.

World-high QSO leader WB9HAD with 1171 was the only one to top last year's 1060 record. Following him were KC8MK* 1048, K1ZM 1012, W8CEM* 1007, K8HA 944, W3BGN* 930, K1NG* 893, K9UWA 887, LZ2CJ 832, W8RA* 825, WB3GCG 819, W8ZV 800. Again, multi-ops are starred. Outside W/VE, high QSO totals were LZ2CJ 832, OK3KFO* 708, GW3YDX* 569, UP1BWB* 510, VP9AD* 507, LZ2KPD* 451, LZ1KOZ 410. Outside N.A./EU, high contact totals were: UA9AKO 205, UA9MA 195, 4X4NJ 127, YV2IF 121.

Four less countries were on, and top multiplier leader W3BGN with 90 was 10 below last year's leader. Others with high multipliers were K1ZM 87; KC8MK 82; K1NG 79; K9UWA 77; AA1K, AA4MM 76; WB3GCG, WB9HAD 75; K3ND, N4IN, W8ZV 72. DX multiplier leaders were GW3YDX 64, YV2IF 63, LZ2CJ 61, VP9AD 60, XE1VIC 57, VP5Z 55, YU1AAO 51.

LZ2CJ with 55 countries was the only one to beat last year's 53 record. Following him were GW3YDX 48; YT2R 47; YU1AAO 46; IV4PRK 45; OK3KFO 45; PA3DFT 43; EA3CCN, I8CZW 42; LZ1KOZ 41. Best W/VE totals were W3BGN 35, AA4MM 32, K1ZM 31, KC8MK 27, K9UWA 26, AA1K 25, K1NG 24, WB3GCG 22. All are far below last year's levels.

Sponsors and winners for the old and several new trophies are shown in the plaques box.

Club Competition

Frankford Radio Club's 2.6 million point score was well ahead of all the others, up from second place last year. Yankee Clipper Contest Club was second with about half the leader's score. Potomac Valley Radio Club wasn't too far behind in third place. These were the only seven-figure scores. There were 66 reporting clubs, down from 78 last year.

Next Time

The CW Contest will be held the last full weekend of January 1987 (Jan. 23–25), and the Phone Contest will be held the last full weekend of February (Feb. 20–22). Send your large SASE to *CQ* with enough postage for the log and summary sheets you plan to use. You can make up your own logs with Universal or GMT, info sent and received, sequentially numbered multipliers as each is first worked, and claimed points. Indicate all your no-point dupes before sending in the log. There then is no penalty for them.

FCC NEWS

BILL GRENFELL, W4GF

7216 Valleycrest Blvd., Annandale, VA 22003

"THE ARRL WILL WRITE THE FCC TO REQUEST INFORMATION CONCERNING THE NEW FCC POLICY UNDER WHICH AMATEURS MAY BE PLACED ON 'REDUCED POWER HOURS' IN CASES WHERE RFI HAS BEEN REPORTED. The letter will ask the Commission specifically about the regulatory foundation for the new policy." (ARRL Letter, 09/02/86).

EFFECTIVE 10/14/86, FCC AUTHORIZED AUTOMATIC CONTROL FOR PACKET AMATEUR STATIONS WHEN RETRANSMITTING THIRD-PARTY TRAFFIC (PR DOCKET 85-105).
Rule section 97.80(b) was amended to provide such control only for stations "...retransmitting digital packet radio communications on frequencies 50 MHz and above." Use of the AX.25 packet protocol was required. "The retransmitted messages must originate at an amateur station which is under local or remote control." Section 97.114(b) (4) was amended to provide exception under the conditions specified in Section 97.80(b). The Commission deferred further consideration of expansion of such operation to digital communications below VHF.

EFFECTIVE 12/01/86, FCC WILL "...ALLOW RE-EXAMINATION CREDIT FOR WRITTEN ELEMENTS PASSED DURING AN OTHERWISE UNSUCCESSFUL AMATEUR RADIO OPERATOR EXAMINATION." (PR DOCKET 86-63). A photocopy of a pending application which indicates the applicant has qualified for a Novice license may be used for examination credit. The effective date is contingent upon approval of appropriate revision of FCC form 610.

SIERRA LEONE IS NOW ONE OF THE COUNTRIES WHICH HAS ARRANGED TO PERMIT ITS AMATEUR STATIONS TO EXCHANGE MESSAGES ON BEHALF OF THIRD PARTIES WITH AMATEUR STATIONS LICENSED BY THE UNITED STATES. FCC's Notice includes cautions about the message content (rule section 97.111), identification of the foreign station at the end of the exchange (section 97.84), and the prohibition of business messages (section 97.114).

DENIAL OF ARRL'S PETITION TO REQUIRE LABELLING OF HOME ELECTRONIC DEVICES AS TO THEIR SUSCEPTIBILITY TO RADIO FREQUENCY INTERFERENCE (RFI) WAS UPHELD BY FCC ACTION ON 10/06/86. The implication to the public that such labelling would be an assurance of the proper functioning of such devices was one of the reasons given for denying the League's petition.

FCC PROPOSED AUTHORIZING OPERATION BY NOVICE AND TECHNICIAN LICENSEES IN ALASKA, HAWAII AND IN THE REGION 2 PACIFIC AND CARIBBEAN INSULAR AREAS IN THE 7050-7075 kHz SUBBAND. (10/06/86, PR DOCKET 86-397). A petition by Dean W. Manley pointed out that interference from international broadcasting made present Novice and Technician operating privileges in the 7100-7150 kHz band virtually useless in those locations. The original comment deadline is 12/22/86 and 01/21/87 is for reply comments.

THE FCC HAS EXTENDED THE COMMENT PERIOD FOR THE NOTICE OF PROPOSED RULEMAKING AND NOTICE OF INQUIRY IN THE MATTER OF AN AUTOMATIC TRANSMITTER IDENTIFICATION SYSTEM" (ATIS), Gen Docket 86-337) TO 01/19/87. The system was described in FCC News two months prior to this report. "Obviously, ATIS is not practical in the Amateur Radio Service where equipment frequently is bought and sold, making it difficult and expensive to keep track of each transmitter." (ARRL Letter, 10/24/86). The ARRL has directed its General Counsel to file comments opposing ATIS "as inappropriate in the Amateur Radio Service." (ARRL Letter, 09/02/86)

"NO GREATER LEAKAGE" SHOULD BE ALLOWED FROM DEVICES INTENDED TO BE ATTACHED TO TV SETS, WHETHER THEY ARE GOVERNED AS A PART OF CABLE RULES OR AS INCIDENTAL OF RESTRICTED RADIATION DEVICES, SAID ARRL IN ITS COMMENTS FILED IN RESPONSE TO FCC'S FURTHER NOTICE OF PROPOSED RULEMAKING, GEN. DOCKET 85-301. (ARRL 10/24/86)

AS A PART OF FCC'S SPECIAL ENFORCEMENT PROGRAM, $35,000 WORTH OF ILLEGAL RADIO EQUIPMENT (CB LINEARS AND TRANSMITTERS) WAS CONFISCATED IN FAIRFIELD, NJ (10/07/86) AND $10,000 WORTH (TRANSMITTERS AND AMPLIFIERS) WAS CONFISCATED AT LOUISVILLE, KY, IN SEPTEMBER. (ARRL 10/24/86, W5YI REPORT 11/01/86)

DAVID ACKLEY, W4UWH, ST. THOMAS, VI, HAS BEEN ASSESSED A FINE OF 1,450 FOR CAUSING WILLFUL AND MALICIOUS INTERFERENCE TO ONGOING AMATEUR COMMUNICATIONS IN VIOLATION OF SECTION 97.125 OF THE FCC RULES. Included in the Notice was violation of Section 97.7(a) for transmitting on a frequency not available to Technician Class licensees and violation of Section 97.84 for failing to identify his transmissions by call sign. (ARRL Letter 10/13/86, Westlink Report 10/17/86)

MORE THAN ONE POTENTIAL CONTRACTOR MIGHT INITIALLY BE CONSIDERED IN THE SELECTION PROCESS FOR A SPECIAL CALL SIGN PROGRAM" ADVISED RAY KOWALSKI, Chief of FCC's Special Services Division, Private Radio Bureau, in correcting a misquote of his remarks at the San Diego National ARRL Convention. He "reaffirmed" his advice that only one group would eventually win the right of issue special call signs which could be used as alternative to the call issued by the FCC. (ARRL 10/24/86)

WE ARE GETTING MORE AND MORE INSTANCES OF PEOPLE WHO ARE ATTEMPTING TO BEAT THE VOLUNTEER EXAMINATION SYSTEM ACCORDING TO RAY KOWALSKI, CHIEF OF FCC'S SPECIAL SERVICES DIVISION. "We're having to deal with more and more instances of either fraud, or improperly administered examinations and various different categories of improprieties." The FCC was reported to have called up two Texas candidates for retesting by a different VE team but they are reported to have declined to take the retest. Kowalski explained that failure to take a retest is not a direct violation of Part 97 rules or of any law. Apparently only where fraud could be proven and used as evidence in a revocation proceeding could action be taken against a licensee involved in an improper upgrade test. I am sure there will be more to report on this subject later! (Westlink Report 10/17/86)

THE ARRL HAS FILED A PETITION WITH FCC REQUESTING THAT IT REVERSE ITS DECISION IN PR DOCKET 85-196 DELEGATING THE RESPONSIBILITY FOR MAINTAINING WRITTEN EXAMINATION ELEMENTS TO VOLUNTEER EXAMINER COORDINATORS (VECs). "The ARRL comments state that it was the intent of Congress that the FCC supervise the examination process through the maintenance of question pools, and that the FCC's Maintenance of them is the only way to ensure standardization among the 25 VECs. A number of other petitions for reconsideration have also been filed." The League concludes that "There must be only one question pool per written element, approved by the Commission, so that candidates are uniformly qualified and that examinations are fair to each candidate." (ARRL Letter, 10/13/86)

THE ELECTRONIC COMMUNICATIONS PRIVACY ACT WAS PASSED BY THE CONGRESS (HR 4952 VERSION) AND SENT TO THE PRESIDENT FOR SIGNATURE EARLY IN OCTOBER. It prohibits eavesdropping on certain communications but does not appear to inhibit listening to amateur radio operation. See last month's FCC News for some of the other communications which are not protected. (ARRL Letter 10/13/86)

A NEW RADIO NAVIGATION SYSTEM IS REPORTED TO BE IN OPERATION FROM THE WEST END OF LAKE ONTARIO ON OR ABOUT 432 MHz. Amateur use of the 430-450 MHz band is on a secondary basis. However, the system's signals threatens amateur weak-signal communications and amateur transmissions could inadvertently interfere with the system with possible

danger to ships relying on it. "CRRL is pursuing the matter closely." (ARRL Letter 10/13/86)

THE NEW (SIXTH) EDITION OF ARRL'S FCC RULE BOOK IS NOW AVAILABLE. Beside the up-dated text of the rules, it includes answers to many commonly asked questions about the meaning of the rules. (ARRL Letter)

OPERATION OF A PIRATE BROADCAST STATION LAST FEBRUARY RESULTED IN IMPOSITION OF A $750 FINE (09/03/86) ON JERRY GASTIL (K6DYD) OF POINT LOMA, CA. (Westlink Report 10/17/86)

WARNING LETTER WAS SENT TO KAY GASTIL OF SAN DIEGO, CA, FOR OPERATING WITHOUT A LICENSE ON THE INPUT TO A SAN DIEGO, REPEATER. (Westlink Report 10/17/86)

ENGAGING IN BROADCASTING, TRANSMITTING UNIDENTIFIED RADIO SIGNALS AND FAILING TO IDENTIFY HIS AMATEUR STATION BY ITS FCC CALL SIGN WAS CITED IN A VIOLATION NOTICE ISSUED TO ROBERT LENTZ, NN6E. (Westlink Report 10/17/86)

TRANSMITTING UNIDENTIFIED SIGNALS AND OPERATION OUTSIDE THE NOVICE BAND RESULTED IN A $150 FINE ASSESSED TO NOVICE OPERATOR CLARA GEMAR. (Westlink Report 10/17/86)

FAILING TO IDENTIFY HIS REPEATER (444.450 MHz ON MT. SAN MIGUEL, CA) BY ITS FCC CALL WAS THE CAUSE FOR A $50 FINE ASSESSED TO LEONARD W. GEMAR, N5IEX. (Westlink Report 10/17/86)

"THE CB BANDITS ARE INVADING 10 METERS IN NEW YORK CITY."
Amateurs are reporting...that numerous unlicensed or 'gypsy' cab companies have invaded 10, most using high power AM on frequencies on or near 29.360.

RELIEF EFFORTS IN THE WAKE OF THE RECENT EARTHQUAKE THAT HIT EL SALVADOR ON OCTOBER 10, WERE COORDINATED BY A PAIR OF AMERICAN HAM RADIO CLUBS: The SPANISH INTERNATIONAL RADIO ASSOCIATION (bilingual group), and the INTERNATIONAL AMATEUR RADIO NETWORK. In addition to handling disaster communications from stateside, some of the SIRA group went to El Salvador to provide on-the-spot communications aid. The IARN provided a list of relief materials for the British Red Cross which resulted in the dispatch from Great Britain of a plane loaded with supplies to aid the relief effort. They also provided information for the news media and for the Salvadoran embassy in London. (Westlink Report 10/31/86)

"FALLS CHURCH, VIRGINIA, AMATEUR MICHAEL WHATLEY, WA4D, HAS BEEN THE SUBJECT OF EXTENSIVE FCC MONITORING FOR HIS ALLEGED 'HIGHLY OFFENSIVE' HAM TRANSMISSIONS." "After the FCC field investigation, PRB's Bob Foosaner ruled (on October 9) that '...this alone does not support imposition of enforcement sanctions, which must be based on violation of specific rules or statutes. The primary purpose of Section 97.78 of the FCC rules (covering good amateur practice) is to promote a high standard of conduct for amateur operators. However, it is not generally useful as an enforcement tool because of its lack of specificity." (Whatley has been under FCC scrutiny for more than two years). (W5YI Report 11/01/86)

A DRAFT INTERAMERICAN CONVENTION FOR THE ISSUANCE OF AMATEUR RADIO STATION OPERATING PERMITS ON A RECIPROCAL BASIS IS UNDER CONSIDERATION BY A COMMITTEE OF THE INTER-AMERICAN TELECOMMUNICATIONS COMMISSION (CITEL). The paper was to be a Convention rather than an agreement. (Unfortunately, a "Convention" is usually much more difficult to modify after adoption than an "Agreement"). It will eventually be presented to CITEL in August, 1987. (ARRL 10/09/86)

"...U.S. AMATEUR STATIONS OPERATED IN GEOGRAPHIC AREAS UNDER FOREIGN JURISDICTION MUST COMPLY WITH THE REQUIREMENTS OF THE FOREIGN GOVERNMENT." (This includes U.S. amateur stations in waters under foreign jurisdiction) "For U.S. licensed amateur stations aboard, the law is Section 301 of the Act." (The United States Communications Act of 1934, as amended). (W5YI Report 11/01/86)

THE NEW CHIEF OF THE FCC'S PRIVATE RADIO BUREAU IS ITS FORMER DEPUTY CHIEF, MICHAEL T.N. FITCH. He succeeds Robert S. Foosaner who was Chief of the Bureau from August 1983 through October 1986, when he left for a position outside the FCC. The new Deputy Chief is Ralph A. Haller, N4RH, formerly with the Commission's Office of Science and Technology Laboratory at Columbia, Maryland.

THE TEXT OF THE AMENDMENT OF THE PART 97 RULES WHICH ALLOW RE-EXAMINATION CREDIT FOR WRITTEN ELEMENTS PASSED DURING AN OTHERWISE UNSUCCESSFUL EXAMINATION IS AS FOLLOWS: "97.25 Examination credit. (b) Upon presentation of a certificate of successful completion of an examination (see Section 97.28(e) for any examination element, examiners shall give applicants for Amateur Radio operator licenses examination credit for any element that has been successfully completed within the previous 365 days. "Examiners shall give applicants credit for Element 1(A) or 2 upon presentation of a photocopy of FCC Form 610 which has been submitted to the FCC indicating the applicant has qualified for the Novice operator license within the previous 365 days. "97.28 Examination administration. (e) A certificate of successful completion of an examination will be issued by the examiners to an applicant who successfully completes an examination element coordinated by a VEC under Subpart L. A certificate is valid for a period of 365 days from the date of its issuance." The effective date of the amendments was moved to 12/15/86 contingent upon approval of necessary revisions of FCC Form 610 by the Office of Management and Budget. (PR Docket 85-63, See FCC News, last month).

BY PUBLIC NOTICE ISSUED ON 11/10/86, FCC ANNOUNCED THAT THE RULES FOR TRANSFER OF MAINTENANCE OF QUESTION POOLS FOR AMATEUR OPERATOR EXAMINATIONS TO VEC'S ARE EFFECTIVE AS OF 12/31/86. Part 97 is amended as set forth in the Appendix attached to the Report and Order in PR Docket No. 85-196 adopted by FCC on 08/04/86.

ON NOVEMBER 6, FCC ANNOUNCED THAT THE MAXIMUM FEE VECS CAN CHARGE FOR AN EXAMINATION IN CALENDAR 1987 WOULD BE $4.37, which is derived from the Department of Labor Consumer Price Index increase of 1.87% during fiscal 1986. The ARRL VEC will round this off to $4.35. "The one fee covers all the elements a candidate may take at a single test session." (ARRL 11/13/86)

UPON RECEIVING A PROTEST FROM AN AMATEUR CONCERNING A NET ACTIVITY FOR DOMESTIC PURPOSES IN THE 3.790-3.800 DX WINDOW, A FCC COMMISSIONER'S ANSWER DECRIED THE SMALL MINORITY WHO WOULD NOT SUPPORT "GOOD AMATEUR PRACTICE", IMPLYING THAT THE COMMISSION COULD BRING SANCTIONS TO BEAR ON THE RECALCITRANTS. The Commissioner wants more teeth in Rule Section 97.78, "Good Amateur Practice". (ARRL, 11/26/86)

"IF YOU RECEIVE AN OFFICIAL LOOKING LETTER OFFERING TO RENEW YOUR HAM LICENSE FOR $50, BE AWARE THAT THIS IS NOT COMING FROM FCC." All it takes to renew an amateur license is a properly filled in FCC Form 610, an envelope addressed to the FCC, P.O. Box 1020, Gettysburg, PA 17325, and a 22 cent postage stamp! The outfit soliciting such renewals (from a Box 610 Gettysburg address!) has been told to make it clear their service was not connected with the Commission but so far has not done so in their publicity sent to Amateur licensees. (ARRL, 11/26/86; Westlink Report, 11/28/86)

THE FCC "...HAS UPHELD A REVIEW BOARD DECISION REVOKING JAMES W. SMITH'S LICENSE FOR W6VCE AND SUSPENDING HIS ADVANCED CLASS OPERATING LICENSE FOR THE REMAINDER OF ITS TERM." The Board concluded that without identifying his station, Smith had transmitted music over his station. It noted he willfully and maliciously caused interference to other amateur operators (ARRL, 11/26/86)

UNFORTUNATELY, BUT IN THE INTEREST OF ECONOMY, FCC NOTICES AND ORDERS ARE NOW BEING SENT BY ELECTRONIC MEANS TO THE DEPARTMENT OF COMMERCE WHERE THEY ARE PRINTED AND RELEASED, RESULTING IN DELAYS OF A FEW WEEKS, RATHER THAN A FEW DAYS, AFTER THE COMMISSION'S ACTION BEFORE THE TEXT IS AVAILABLE TO THE PUBLIC. (ARRL Letter, 11/21/86)

"THE ELECTRONIC COMMUNICATION PRIVACY ACT OF 1986, MOST RECENTLY KNOWN AS HR 4952, WAS SIGNED INTO LAW BY PRESIDENT REAGAN ON OCTOBER 21. It now is known as Public Law 99-508. Senate Report Number 541, which explains the bill, may be requested from the offices of your local Congressman or Senator. Additional information will be available in an early issue of QST." (ARRL Letter, 11/11/86)

FCC'S GENERAL DOCKET 85-301 TO RELAX THE PRESENT TECHNICAL RESTRICTIONS ON RF LEAKAGE FROM CABLE TERMINAL DEVICES "IS ILL-

ADVISED" COMMENTS THE ARRL IN ITS FILING IN THE DOCKET PROCEEDING. The League reports its engineering studies have established that even present limits permit cable systems to leak RF on some amateur frequencies, producing severe interference at distances in excess of 100 feet. "ARRL further states that the cable operator should be responsible for disconnecting any terminal which is leaking RF in excess of FCC rules whether or not owned by the subscriber, and obligation to resolve any RF-generated interference should rest with the cable company." (ARRL Letter, 11/11/86)

THE ENVIRONMENTAL PROTECTION AGENCY PROPOSAL TO LIMIT PUBLIC EXPOSURE TO RF RADIATION WOULD DIRECTLY AFFECT ONLY GOVERNMENTAL ENTITIES. (The comment period ended 12/15/86.) "Separate action by FCC would still be necessary to impose the standard on FCC licensees after it is adopted." (ARRL Letter, 11/11/86).

"RIGHT NOW THE BEST GUESS ON A RELEASE BY THE FCC ON NOVICE ENHANCEMENT IS SOMETIME LATE IN THE FIRST QUARTER OF 1978." (Westlink Report, 11/14/86). See FCC News two months ago for details on the expansion of Novice and Technician privileges (including 28 Mhz voice) proposed in PR Docket No. 86-161.

WHEN ASKED WHAT WAS THE STATUS OF AMATEURS BEING ABLE TO SELECT A CALL SIGN OF THEIR CHOICE, AN FCC OFFICIAL REPLIED "WE ARE STILL POSITIVE (ON) THE CONCEPT, AND HOPE THAT AROUND THE FIRST OF THE YEAR WE WILL BE ABLE TO HAVE SOMETHING ON IT 'OUT IN THE STREET'..." "The first thing we will ask is the threshold question. "Is it a good idea to have a special amateur call sign system administered in the private sector...and if it is, what is a good way of doing it."..."We think that sometime this winter (we) will be going out with an inquiry along those lines." (W5YI Report, 11/15/86)

ON 10/23/86, FCC PERSONNEL DESTROYED AN ESTIMATED $65,000 WORTH OF ILLEGAL RF AMPLIFIERS AND MODIFIED CB TRANSCEIVERS AT SAN FRANCISCO. Collected from several CB sales outlets and from individual CB operators, the radios operated on frequencies outside the CB Radio Service with unauthorized emissions and illegal transmitter power and were capable of causing harmful interference to public safety and emergency radio services as well (as) to home electronic equipment. (W5YI Report, 11/15/86)

WHEN ASKED ABOUT A CONFLICT BETWEEN TWO REPEATER COORDINATORS CLAIMING AUTHORITY OVER THE SAME AREA, AN FCC OFFICIAL REPLIED: "THE FCC INTENDS TO RELY UPON STATE AND REGIONAL COUNCILS TO RECOGNIZE LEGITIMATE LOCAL COORDINATORS. "...Revocation of regional and state council recognition of the other local coordinator is prima facie evidence that the coordinator no longer has the support of a majority of those eligible to establish repeaters in the area it claims to coordinate. Stations which operate with illegitimate repeater coordination do so at their peril." "...it is the licensees of these repeaters not the coordinator - who risk sanctions if interference occurs." (W5YI Report, 21/10/86)

A 3-CHANNEL 440-450 MHz FM HANDI-TALKIE HAS BEEN "PITCHED" FOR SALE TO "INDUSTRY". "Salesman apparently was unaware that a ham license is required." (W5YI Report, 12/01/86)

REPORTS ARE BEING RECEIVED "...ABOUT AMATEUR RADIO OPERATORS WORKING DX THROUGH AN UNUSUAL SPECTRUM COMBINATION OF 75 METER HAM BAND FREQUENCIES BEING UP-LINKED TO A COMMERCIAL SATELLITE TRANSPONDER." It seems that a (member) of a Salt Lake City, Utah, group calling itself 'FM America' was uplinking amateur transmissions to hams around the country who also owned TVRO backyard satellite dish set-ups. Transmissions on 20 and 75 meters are uplinked from Murray, Utah, to the Telstar 303 satellite. Only the audio is transmitted on Transponder 18's 6.2 MHz audio channel. Amateurs have long distance two way communication by talking on 20 or 75 meters and listening to their TVRO earth station. When asked about such use of common carrier satellite delivered signals, an FCC official responded in part with: "I would say that common carrier up-linking of amateur signal will certainly focus a great deal of attention in the area and could lead to some interesting precedents. Every time you get our attention with a particular mode of conduct, all related modes of operation come into question and you take the consequences!" (W5YI Report, 12/01/86)

FCC ADVISES "...THAT EXAM IRREGULARITIES IN TESTS OF CANDIDATES EXAMINED UNDER THE ALL VOLUNTEER TESTING PROGRAM IS NOT A VIABLE REASON FOR RETESTING, BUT THE COMMISSION WILL SEEK LICENSE REVOCATIONS AND OTHER PENALTIES IN CASES WHERE FRAUD IN THE EXAMINATION PROCESS CAN BE PROVEN." VECs must weed out cheaters-be they exam candidates or members of VE teams. VECs may simply not certify examinations if there is something wrong with a test. "In that case, there would be no re-testing involved. "The individuals simply wouldn't get their licenses where the VEC had determined this." The FCC does retain its right to reexamine any amateur operator licensee. (Westlink Report, 11/28/86)

INSTANT AMATEUR RADIO LICENSES ISSUED THROUGH THE ALL VOLUNTEER TESTING PROGRAM IS THE SUBJECT OF A RULE MAKING REQUEST FILED WITH FCC. The petitioner "...proposed that the FCC end the waiting period between the time and unlicensed person takes a test and receives a license by having the Commission issue random blocks of unassigned calls to VECs for distribution to candidates who successfully pass an amateur exam." "The FCC would continue to use its current 'sealed envelope' technology for distributing callsigns, with the callsigns printed on the license form by the commissions computer." (Westlink Report, 11/28/86)

END-OF-MONTH (OCTOBER) LICENSE TOTALS:
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DXCA

DX CENTURY AWARD

GENERAL RULES

The DXCA program is sponsored by the International Radiosport Association and RADIOSPORTING magazine for all licensed radio amateurs and short wave listeners all over the world.

All contacts must be made from the same country. Maritime, aeronautical and land mobile stations may operate from anywhere in the world.

Only contacts made after January 1, 1986 are valid for the basic award.

Awards for club stations will be issued to the club and not to an individual operator.

All amateur bands for which an applicant holds a valid license may be used, including new WARC bands.

QSL cards for the awards must be in the possession of the applicant. The application for the award must be certified by two licensed amateurs with a statement that the list of contacts and QSL cards agree. Any altering or forging will result in disqualification. The IRSA Awards Committee has the right to request the QSL cards for verification.

The ARRL DXCC countries list criteria will be used in determining what constitutes a "country." A particular operation or DXpedition does not have to be recognized by the ARRL in order to count for DXCA (i.e. Burma). As long as there is a reasonable proof that the operation took place as claimed, it will be recognized. If it is found in the future that certain operations were not legitimate, the credit for that operation will be removed from all applications claiming the operation in question.

All officially allowed modes of communication may be used: CW, SSB, AM, FM, RTTY, Packet, SSTV and Mixed mode. Also separate categories will be recognized for satellite contacts, QRP, QRPP and Mobile stations. All contacts must be two way, using the same mode, except for the mixed mode. A valid contact must consist of a call sign and signal report exchange.

All claimed contacts must be made by the operators themselves, without the help of a third party, i.e. list or net operation. Non interference with commercial services on shared bands, fair play and good sportsmanship are required of all DXCA holders and applicants. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from the DXCA by action of the DXCA Awards Committee.

The application must contain a station's callsign, name and address, type of award applied for and list of contacts. The list of contacts and any QSL cards in possession must include: callsign, signal report received, band, date, time GMT and two way mode.

Callsigns of all certificate holders will be published in RADIOSPORTING magazine and a DXCA Honor Roll will be published twice a year.

The first twenty winners of monoband and multi band awards will receive a free one year subscription to RADIOSPORTING Magazine.

The decisions of the IRSA Awards Committee are

SINGLE BAND DXCA

Single band DX Century Award is issued for working or hearing a minimum of 100 countries on one band. Endorsement stickers are issued in increments of 20 countries up to 240, increments of 10 up to 300 and increments of 5 above 300 countries.

Contacts made on all amateur bands (1.8, 3.5, 7, 10, 14, 18, 21, 24, 28 MHz and all VHF/UHF bands), as permitted by the license in the country of the applicant, are eligible for award. All contacts must be made on one band. No crossband contacts are allowed.

The basic award will be issued for a minimum of 100 countries confirmed on one band. A numbered endorsement stickers will be issued for each mode (CW, SSB, AM, FM, RTTY, Packet, SSTV and Mixed) and category (satellite contacts, QRP, QRPP and Mobile stations).

The holders of Single Band DXCA are allowed to use the abbreviation signifying the type of award and country total on their QSL cards.

Example: "1.8 DXCA" or "1.8CW DXCA 124/265" which means: Monoband 1.8 MHz, all CW mode, DXCA, 124 countries confirmed since Jan. 1, 1986/ number of countries worked.

MULTI BAND DXCA

6B DXCA, 7B DXCA, etc. awards will be issued for confirmations from a minimum of 100 countries on each of at least 6 bands. A separate awards will be issued for working 100 countries on 7, 8, or more bands.

Also a cumulative total will be kept for an overall countries count similar to the monoband awards. i.e. 7B DXCA (856/1265), which signifies that station has confirmed a minimum of 100 countries on each of 7 bands and the total count is 856 countries since Jan. 1, 1986 and 1265 countries on 7 bands worked. A numbered stickers will be issued for each mode and category.

Stations having monoband DXCA need not submit the list of contacts already credited for monoband awards. It is sufficient to mention the certificate type and number, and only an additional list of contacts has to be submitted.

Stickers for increments of 100 countries will be issued from 600 to 2000, increments of 50, from 2000 and up.

The Honor Roll - listing of top contenders and latest changes in standings will be published in RADIOSPORTING magazine twice a year.

The fee for each award is US $5 or 10 IRCs, and each endorsement sticker is $2 or 4 IRCs. Engraved Honor Roll plaques will cost $25.

A set of application forms and countries list for DXCA awards are available from IRSA for SAE and 3 IRCs.

All applications to be sent to IRSA - DXCA, Box 282, Pine Brook, NJ, 07058, USA

RADIOSPORTING

INTERNATIONAL MONTHLY MAGAZINE -
BY AND FOR ACTIVE RADIOAMATEURS

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